International Corporate Strategy in Network Based Industries

Fladung, M.

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International Corporate Strategy in Network Based Industries

A Case Study for the Emerging Multimedia Industry

Promotores:

Prof.dr.ir. Philippe A. Naert
Prof.dr. Filip Caeldries

INTERNATIONAL CORPORATE STRATEGY IN NETWORK BASED INDUSTRIES

A CASE STUDY FOR THE EMERGING MULTIMEDIA INDUSTRY

Proefschrift ter verkrijging van de graad van doctor aan de Universiteit van Tilburg,
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Michael Fladung

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Bastheimstraße 24
D-36100 Petersberg
michael@fladung.de

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Introduction

There were two reasons that led me to conduct research on the topic of international corporate strategy amidst an uncertain organisational structure within the telecommunications industry. First, my profession as business development manager and consultant demand an extensive knowledge about the ongoing changes within the industry. Secondly, my MBA curriculum, particularly the course about international marketing, provided valuable insights into the topic, but increased my appetite for additional knowledge.

In 1997, as business development manager at Unisource, a division of Swiss PTT, I had the opportunity to define the division's international expansion strategy for entering Austria. Simultaneously, I attended Professor Philippe Naert's marketing strategy course through the University of Bern's MBA Program. He presented several interesting strategy concepts and asked the course participants to write a case study as our final exam. My case study dealt with the issue of Unisource's entrance into the Austrian market, specifically an analysis of telecommunications activities and a definition of an international strategy to expand a company's value chain internationally.

Both the case study and my business development work were successful, that is, I succeeded in my marketing case and the company implemented its expansion strategy. However, this strategy proved to be unsustainable.

From an academic perspective, my marketing case applied various globalisation methodologies. However, the chosen methodologies raised several new issues that could not be addressed within the scope of a marketing case, for example, the impact of convergence, upcoming deregulation, and new technologies upon the industry landscape, the entrance of competitors into the Austrian market and their strategic approach, and the implications of these developments for Unisource´s strategy.

The Unisource division in which I worked was eventually re-integrated into Swiss PTT. At the same time, Swiss PTT went through a reorganisation and renamed its telecom unit Swisscom. The strategy that was originally approved by Unisource was still backed by senior management, but was implemented under the name Swisscom. Swisscom's first subsidiary, Swisscom Austria, existed for only one year before it was integrated into a new joint venture between UTA and Swisscom in Austria. This joint venture has now been divested and Swisscom is currently conducting acquisition talks with Telekom Austria.

All of these developments occurred within a time span of six years. My motivation for writing this book is, based upon my own experiences, to assist managers in defining a more sustainable international strategy through a sound economic base.

Strategic question

Until 1998, the telecom industry in Europe was clearly defined and characterised by national vertically integrated monopolies that provided telephony and leased line services. Historically, telecom operators were often an integral part of the national postal operator. Following deregulation in most European countries in 1998, telecom operators faced many changes within the industry.

At that time, new players like AOL, Colt, MCI, Qwest, Level 3 and Yahoo were emerging. For some of the new entrants, the second development stage with mergers and acquisitions has already taken place. A well-known example in the press was the Vodafone and Mannesmann takeover battle in 2000. Furthermore, the scope of telecom operators has been extended into other areas through mergers with computer companies or media services, as in the case of Olivetti, which bought Telecom Italia in 1999.

The rules of the game remain unclear to all participants. Uncertainty about the best strategic move and the future structure of the industry can also be drawn from the extremely volatile stock market development of incumbents' and new entrants' shares.

Telecom operators who were formerly monopoly operators have lost part of their 100% market share in their nationally protected market. To react to this change, these telecom operators have attempted to expand the scope of their business, for which entering new geographical markets is one of the strategic options.

These industry changes also set the stage for Swisscom, the former monopoly telecom operator in Switzerland. Swisscom was under the same pressure as other European telecom operators, in that deregulation enabled competitors to enter their formerly protected home market. Consequently, Swisscom considered the entrance into the Austrian telecommunications market as one of their international extension strategies.

The research for Swisscom's entrance into the Austrian telecommunications market defines the empirical question that is the subject of this book, namely:

How can a vertically integrated incumbent telecom operator
sustainably extend its geographical scope
after deregulation in the emerging multimedia industry?

This question contains several aspects that are addressed in the book, for example:

What are the nature and problems of vertically integrated incumbent telecom operators?

How does deregulation affect the industry?

What is the globalisation potential in the telecommunications industry?

What other trends are reshaping the industry?

The answer to these questions provides the basis for the strategic discussion. Intense research was conducted on the emerging multimedia industry, including the nature of the telecom arena, the economics of network based industries and the ongoing trends in the industry.

This research led to the realization that a high degree of uncertainty exists about the future of the industry's organisation. Merger and de-merger activities, as well as several failed strategic moves on the part of telecom operators, provide evidence of the uncertainty within the industry (Vodafone Mannesmann, Global Crossing, AOL Warner, AT&T Unisource, KPN Qwest, Level 3). The uncertainties involved in dealing with the future demand the application of appropriate methodologies and concepts.

The international corporate strategy process was carried out through all phases to make the described concepts plausible and provide integrated answers to the above questions. Theories about the economics of network business, globalisation and handling uncertainty supported this process.

This conceptual basis created the framework for the book. Numerous discussions with industry experts and my consulting work in the industry further developed the framework and stabilised the argumentation. The process of defining international corporate strategy in an uncertain industry environment is applied to several concrete examples that give specific answers to the above questions.

It is hoped that the concepts and strategic advice developed in this thesis make substantial contributions to managerial practice and the academic field of **international corporate strategy.**

International Corporate Strategy

The title of one of Michael Porter's publications (Porter 1996) is *What is strategy?*. It is also a pertinent question related to this book. Porter has the following to say about corporate strategy:

> *"Corporate strategy, the overall plan for a diversified company, is both the darling and the stepchild of contemporary management practice" (Porter 1987:43).*

According to Porter, corporate strategy is simultaneously a 'darling', as CEOs have been obsessed with diversification, and a 'stepchild', since no consensus exists about what corporate strategy is or how to formulate it. Other authors agree that the term corporate strategy is not clearly defined. Consequently, they prefer to formulate the purpose of corporate strategy as a question (Mintzberg 1998, Porter 1980, Grant 1998). This chapter will first define the usage of the term corporate strategy and then integrate the issues of international strategy.

> *"Next comes the question of what strategies of a generic nature are available to extend and reconceive that core business. These are approaches designed to answer the corporate level question, "What business should we be in?" (Mintzberg 1998:347)*

Instead of defining the term corporate strategy, Mintzberg investigates what the scope of the corporation should be. He then goes a step further and points out the existence of vertical and horizontal strategic paths.

> *"Strategies designed to take organizations beyond their core business can be pursued in so-called vertical or horizontal ways, as well as combinations of the two." (Mintzberg 1998:347)*

Porter and Grant both agree that corporate strategy should answer the question "what business should we be in?". In addition, Porter considers the role of the corporate office.

> *"Corporate strategy concerns two different questions: what businesses the corporation should be in and how the corporate office should manage the array of business units." (Porter 1987:43)*

Grant adds the perspective of how a corporation achieves its goal based upon its current situation.

> *"Corporate strategy defines the scope of the firm in terms of the industries and markets in which it competes. Corporate strategy decisions include investment in diversification, vertical integration, acquisitions, and new ventures; the allocation of resources between the different businesses of the firm; and divestments."(Grant 1998:19)*

The second field of strategic management is called "business strategy" or "competitive strategy". Business strategy supports the managerial process in the positioning of a firm's scope in the market.

> *Business strategy is concerned with how the firm competes within a particular industry or market. If the firm is to prosper within an industry, it must establish a competitive advantage over its rivals. Hence, this area of strategy is also referred to as competitive strategy. (Grand 1998:19)*

The focus of this book is corporate strategy. Business strategy, on the other hand, is set with regards to a firm's chosen position.

The international aspect of corporate strategy is pertinent to the question "what business should we be in?". This question includes both the scope of the corporation as well as its geographical perspective. Existing literature provides structured approaches about how to analyse the industry and define international strategy (Porter 1985, Yip 1992, Bartlett 1998). George S.Yip, one of the leading researchers in international strategy, provides generic strategy levers for expanding a firm's business internationally.

> *"Globalisation strategy is multidimensional. Setting strategy for a worldwide business requires choices along a number of strategic dimensions. Some of these dimensions determine whether the strategy lies toward the multilocal end of the continuum or the global end. "*(Yip 1992:15)

Yip specifies the dimensions for all elements of international strategy. However, he does not differentiate between corporate and business strategy. In fact, few authors of international strategy differentiate between the two levels. Instead, they focus their discussion of international strategy on the business level. The main focus of existing literature is the implementation of international strategy in the current business context (Hamel/Prahalad 1989, Bartlett/Ghoshal 1998, Quelch/Hoff 1986). This book applies some of the international strategy concepts in order to answer the previously posed strategic question (Bartlett/Ghoshal 1998/ Coyne 1998).

The fundamental reorganisation of the industry after deregulation (c.f. Part I) pose a challenge in defining the scope of a telecom operator's corporate strategy process. Of particular interest is the integration of the international aspect at the beginning of the twenty-first century.

A definition of international corporate strategy needs to address the following questions:

- What international business should the corporation be in?
- How should the corporation be structured to manage this business?
- How does the corporation get there?

The strategic question has shown that telecommunications operators have significant problems in defining their international corporate strategy. Therefore, the final title, incorporating both the developments within the telecommunications industry, and international corporate strategy, is:

International Corporate Strategy in Network Based Industries

- A case study for the Emerging Multimedia Industry

As the title implies, the main topic of this book is international corporate strategy in the multimedia industry. However, during the industry analysis phase, it became clear that the primary issue in international strategy is the uncertainty in the future organisation of the industry. The goal of achieving sustainable guidelines in the strategy process requires placing an emphasis on globalisation potential in the multimedia industry and the uncertainty of the future organisation within the industry.

The answer to the strategic question is presented in several steps. The first step (Part I) in the process is the definition of the industry arena, the underlying economics and the analysis of industry trends based on current literature and management workshops. The second step defines the problems and potential solutions, and is the main topic of part II of this book. The final step combines the analysis of part I and the solutions of part II into the corporate strategy process for guidelines in the international corporate strategy.

From an academic viewpoint, the book delivers a complex, but real case, in which theory meets practice. From a practical viewpoint, the framework can be applied in defining strategies that are more sustainable than those currently implemented within the industry.

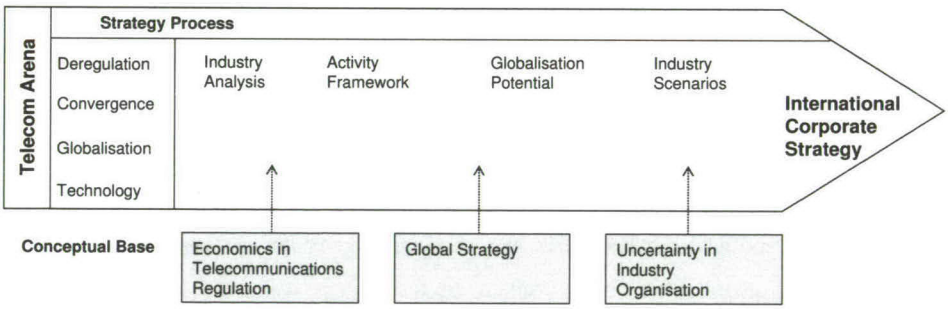
Methodology

The current trend towards deregulation creates a high level of uncertainty about the future organisation within network-based industries. However, the integration of industry knowledge with theoretical concepts helps to overcome the challenges related to the uncertainty and make a company's strategic moves more sustainable.

The methodology chosen for this book is aligned with managerial practice. The book follows the corporate strategy process from industry analysis, then to a focus on specific problems, and lastly, strategic advice. The conceptual base is integrated into the process at those stages where it strengthens the reasoning or provides tools for overcoming specific problems. Consequently, this approach contributes to academic theory building through the application and integration of current conceptual tools, and benefits both managerial and consulting practice.

The diagram below shows the interaction between the strategy process, industry trends and the conceptual base.

Figure 1: Integration of theoretical concepts into the strategy process



The industry analysis shows that the future telecom arena will be an integrated part of the emerging multimedia industry. At the same time, the current managerial perspective of a telecom operator is maintained in the argumentation, and is supported by practical examples, based upon personal experience in the international telecommunications market.

Structure of the book

The research areas covered in this book span a wide area with different methodologies, periods and levels of detail. The book is organised in three parts that cover the overall strategy process. Figure 2 provides a graphical overview of the structure.

Part I contains the generic industry analysis with two goals, namely to:

1. provide the background of the industry, and to
2. define the nature of the problem in the strategy process

Chapter 1 covers the results of a literature search on the history, organisation and regulatory developments of the classical telecommunications industry.

Chapter 2 looks at the specific economics involved in network based industries, from the reasoning behind natural monopolies to the economics of deregulation, contestability theory, infrastructure characteristics and network externalities.

Chapter 3 looks at the trends reshaping the current telecommunications industry. The important trends analysed are convergence, technology, globalisation and the changes in industry structure. An important issue covered in this chapter is the change in focus from the telecom to the multimedia industry due to ongoing industry changes.

Part II is based on the results of Part I. To overcome the problems in the strategy process, analytical tools are selected and applied to create an industry framework as part of the industry analysis. Two primary topics are covered, namely the:

1. logic of globalisation in the multimedia industry, and
2. dealing with the uncertainty in industry organisation

Chapter 4 contains the problem statement for the globalisation aspects in the multimedia industry. The underlying conceptual base is used to solve the stated problem statement and is applied to the current industry situation.

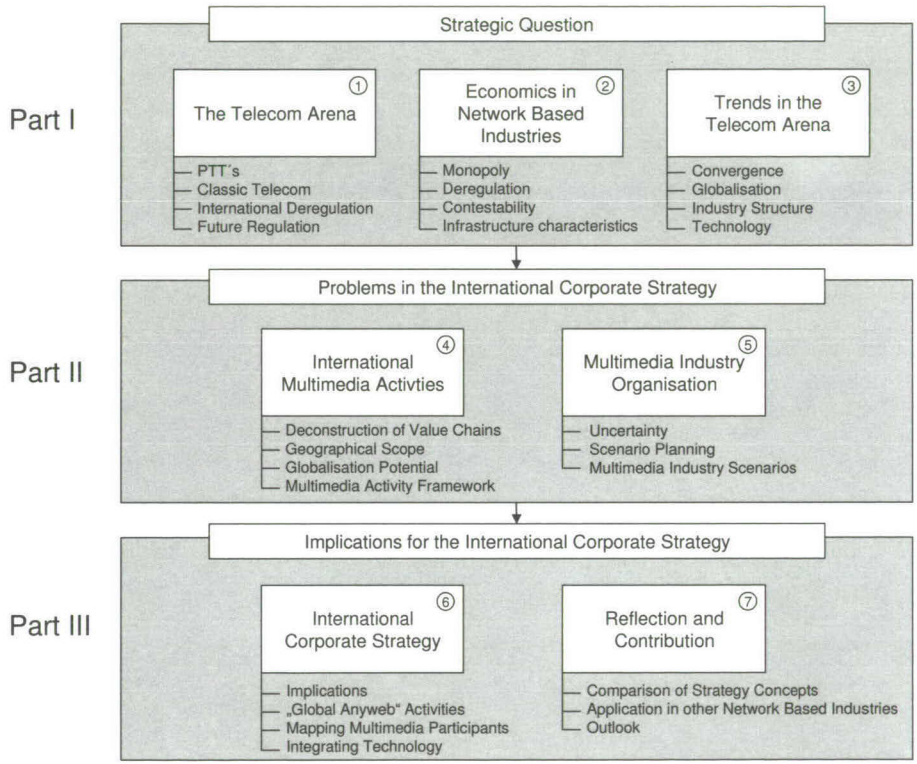
Chapter 5 contains the problem statement for the organisational uncertainty within the emerging multimedia industry, as well as the development of three scenarios of future stages in industry development.

Part III looks at the implications of the industry analysis for different types of multimedia participants.

Chapter 6 shifts the focus from the industry to the corporation. The elements of the industry analysis and the multimedia industry framework are tied together to show how those components interact in the corporate strategy process.

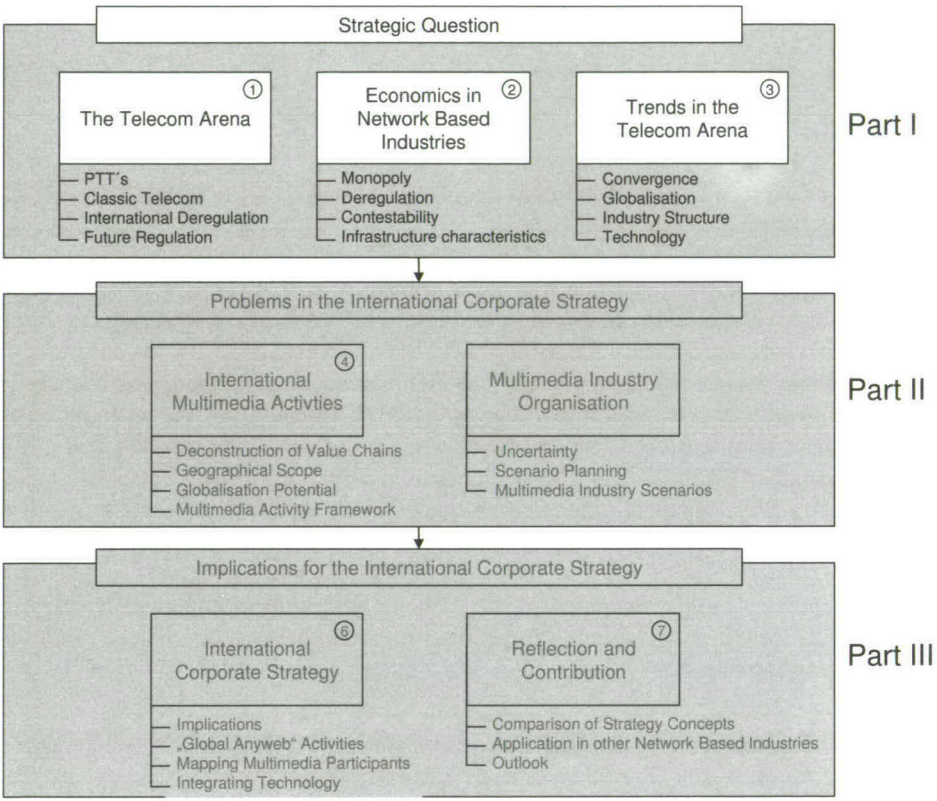
Chapter 7 returns to the original strategic question and provides an overview of how different theoretical concepts support the international corporate strategy process, and how the framework developed can be transferred to other industries like the utility and transportation industries.

Figure 2: Structure of the book



The international corporate strategy process is carried out on the basis of examples from the first step of the analysis to the point where concrete strategy statements can be formed. The book as a whole is a combination of economic concepts and business theory and methodologies complemented by empirical reasoning that is derived from more than ten years of personal managerial and consulting experience in the multimedia industry.

Part I: Evolution of the Telecom Arena



1 The Telecom Arena

The strategic question that motivated me to write this book is set in the context of developments in what I call the "telecom arena".

The term "arena" is well suited to describe what is currently taking place in the telecommunication services industry. Meriam-Webster Online Dictionary lists the following entries for "arena":

> *1 : an area in a Roman amphitheatre for gladiatorial combats, and ....*
> *3 a : a sphere of interest, activity, or competition (Meriam-Webster 2003)*

The description "a sphere of interest, activity or competition" serves as the basis for defining the term "arena" in this book.[1]

A decade ago, the telecom arena was easily described, in that the 189 member states of the International Telecommunication Union (ITU) each had a monopoly operator that provided communication services (ITU 2003). Deregulation in the majority of the member states reshaped the picture significantly. Today, there are numerous companies who wish to enter into a country in which deregulation has taken place, or who already pose a threat to the incumbent. In Austria, one of the smallest European Union member states, nearly 500 telecommunication licences were granted to new entrants in 2002. Currently, the telecom arena is wide open for the creation of a new industry.

In this chapter, I will development of the industry environment and explain the need for change for the involved industry participants. This part of the industry analysis will be presented in three steps:

- The first step provides the historical perspective on the transport of people, goods and information in the monopoly area of postal, telegraphy and telephony service providers (PTT).
- The second step describes the main activities and specifics of what I call the classic telecom operator preceding the first major round of deregulation, and provides the basis for the remainder of this book.
- Step three analyses the impact of deregulation and the driving force for change within network-based industries during the last decades, upon telecom operators' need to consider international strategy.

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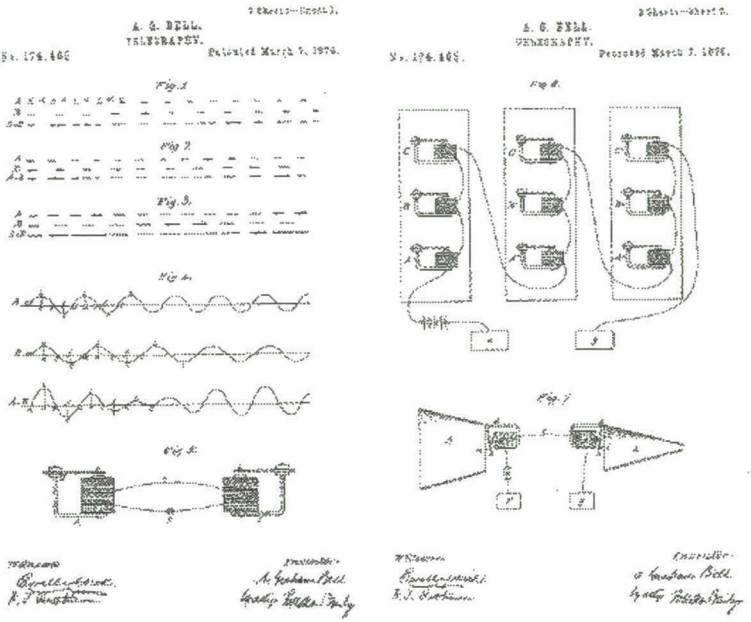
[1] *Comment: The first definition also contains a lot of truth. The telecom industry can be compared to an old Roman amphitheatre. Closed environments where several players are fighting against each other, until part of them are taken over or forced to discontinue their business.*

1.1 Telephone services as state monopolies

The beginning of telephony dates back to March 7, 1876, when Alexander Graham Bell patented the "Improvement in Telegraphy" under Nr. 174465 in the United States of America (USPTO 1876). The picture below shows the first two pages of his patent.

Figure 3: The first two pages of the patent from Alexander Graham Bell



Source (USPTO 1876)

The first telephony trials were exclusively within cities, and regulation was handled by the local government. Few people realized how important Bell's invention would become for our society. In fact, its relevance was initially so marginal, that the handling of telephony companies within the regulatory environment was not defined. Soon cities within a country were interconnected and the benefit of telephony services increased.

The regulatory environment and the infrastructure necessary to provide telephony services varied from country to country. The closest comparison to existing telephony services was the telegraphy service, which at that time served as a guideline for the introduction of telephony services and the relating regulatory environment.

The invention of the telephone led to a new means of communication. One important question that was raised was if telephony, like telegraphy, would become a monopoly business.

During most of the 20th century, the majority of developed countries had monopoly telephony services. The service quality was low compared to today. For example, people had to wait for months until they received a telephone line, and the colour of one's telephone was extremely limited.

Figure 4: The first telephone system

Source: Scientific America, October 6. 1877

On the other hand, the telephone almost always functioned, and users never had to refer to a manual, recharge a battery, or change any other usage behaviour. During the period of monopoly telephony services, there was little innovation, but also a high reliability of service.

It is interesting to note that people, regardless of the country in which they lived, had the same experience with monopoly telephony services. The next section provides a historical background about the development of telephony service monopolies in the US, Germany, Switzerland and Austria.

1.1.1 Development of the telephone service monopoly in the US

In the US, Graham Bell wanted to sell his invention to Western Union, which, at that time, was the most powerful telegraph company. However, Western Union did not buy the Bell patent, believing the device was nothing more than a passing novelty. In 1877, Graham Bell established monopoly services with a private company, secured by his patent, for a period of fifteen years.

In 1880, Theodore Vail assumed the position as COO of the Bell Company. Through Vail's vision and management capabilities, Bell Telephone Company eventually became AT&T.

> *The company that became* ***AT&T*** *began in 1875, in an arrangement among inventor Alexander Graham Bell and the two men, Gardiner Hubbard and Thomas Sanders, who agreed to finance his work. Bell was trying to invent a talking telegraph -- a telephone. He succeeded, earning patents in 1876 and 1877. In 1877, the three men formed the Bell Telephone Company to exploit the invention. The first telephone exchange, operating under license from Bell Telephone, opened in New Haven, CT in 1878. Within three years, telephone exchanges existed in most major cities and towns in the United States, operating under licenses from what was now the American Bell Telephone Company. In 1882, American Bell acquired a controlling interest in the Western Electric Company, which became its manufacturing unit. Gradually, American Bell came to own most of its licensees. Collectively the enterprise became known as the Bell System. The* ***American Telephone and Telegraph Company*** *was incorporated on March 3, 1885 as a wholly owned subsidiary of American Bell, chartered to build and operate the original long distance telephone network. Building out from New York, AT&T reached its initial goal of Chicago in 1892, and then San Francisco in 1915. On December 30, 1899, AT&T acquired the assets of American Bell, and became the parent company of the Bell System (AT&T 2003).*

During the period from 1894 until 1913, the patent monopoly area gradually came to an end, and competition arose in several US cities. Around 1900, there were over 200 telecom operators in the US.

Between 1880 and 1895, growth was slow, but constant. For example, the number of average daily calls per 1,000 inhabitants rose from 4.8 to 37(Thierer 1994). Following the expiration of Bell's patent, private telephone companies emerged all over the country and initiated significant growth in telephony usage. Bell's company lost its market power and in 1907, was sold to J.P Morgan. During the following period, Theodore Vail, by then the new president of AT&T, managed to restructure the company and gain an impressive market share.

By 1913, AT&T had grown to such a large size that the company was given a warning that it could come under antitrust observations following the Sherman Act. However, Theodore Vail was able to influence the government in such a way that AT&T received the opportunity to grow further. In the years that followed, public opinion changed in a way that telecommunication was seen as a natural monopoly (c.f.2.2.1). In 1921, this was made official through the Graham Wills Act.

The Depression in the 1930s prompted a new thinking within the U.S. government and business circles. Policy makers believed that the Depression was partly caused by competitive markets and could be solved through government intervention. During the period of Franklin Roosevelt's "New Deal", the US experienced a tendency towards regulation of industries and the emergence of several monopolies.

1.1.2 Development of the telephone service monopoly in Germany and Austria

The existence of state monopolies for the transportation of goods and people has a long history in Europe. Voice and data services were initially regulated as one category.

The original set-up of voice and data services was developed in the "Heiliges Römisches Reich Deutscher Nation". In 1597, Emperor Rudolf II granted the "Kaiserliche Postregal"[2] to the family which is now known under the name "Thurn und Taxis". This family dominated the postal services in Germany and Austria until 1867 Prussia bought back the rights and took over the postal monopoly. The area that "Thurn und Taxis" originally covered with its services changed with the development of the political map in Europe. In Austria, Kaiser Karl VI declared postal services a state monopoly in 1722, and separated the service from "Thurn und Taxis" management.

The content of state monopolies changed over time. The transportation of people led to a growing importance of steamboats and railways. The transportation of information received greater importance through the invention of telegraphy. Samuel Morse's invention in 1830 gave rise to telegraphy services. In many countries, telegraphy services were a part of the postal monopoly, as the definition of telegraphy, like the post, was the transportation of messages.

In Germany, the first telephone connection was established by the general postmaster Heinrich v. Stephan and the general telegraph director Budde, who with the help of two telephones from Graham Bell, called one another on October 26,1877. After their successful telephone call, v. Stephan and Budde immediately requested the company Siemens & Halske to produce more of the Bell technology-based telephones. On December 14, 1877, Germany's Werner von Siemens received the Patent Nr. DRP 2399, entitled "Telephone und Rufapparate mit magnetischer Gleichgewichtlage der schwingenden Teile"(Telefonmuseum-Hittfeld 2003).

In 1855, the role of the government in telegraphy services was discussed within the various German states. In Prussia, the first proposal for a telegraphy law included the reasoning for a monopoly service, namely that telegraphy carries with it the character of a state institution that cannot be given to the private industry for political, financial and commercial reasons. Following the creation of the "Deutsches Reich", the "Deutsche Reichspost und Telegrafenverwaltung" was unified and incorporated in 1876.

[2] Regal is a historical term similar to monopoly

Telephone services, which were introduced by the "Deutsche Reichspost and Telegraphenverwaltung", and considered an evolution of telegraphy services, were integrated into the state monopoly in 1877(Feyerabend 1929).

In that same year, Graham Bell's telephone technology was introduced in Austria, and thereafter in Germany. However, the initial commercial usage did not take place until 1881. The "Wiener-Privat-Telegraphen-Gesellschaft" applied for a licence in 1879, but it took the ministry of trade until June 3, 1881 to grant a licence for a radius of 15 kilometres around the "Stephansturm" in Vienna. In 1892, at which time five companies offered telephone services in Austria, the government decided to nationalize all telephone companies. By 1895, all of the telephone companies were integrated into the "Östereichische Post- und Telegraphenverwaltung"(Günther 1992).

1.1.3 Development of the telephone service monopoly in Switzerland

During the period of "Thurn und Taxis", the "Eidgenossen" of Switzerland were politically independent from the surrounding "Heiliges Römisches Reich Deutscher Nation", therefore, regulation developed independently.

Telephony services in Switzerland were part of the country's telegraphy services, and beginning in 1878, run as state-owned monopolies (Spiech 1999), as the government did not want to assume the risk of building up telephony infrastructure without knowing if the technology would succeed. As a result, the "Telegraphen-Direktion" issued licences to private companies. The first telephony service was introduced by a private company in Zürich.

However, customers complained about the quality of service and speed of execution provided by private companies, which in 1880 led to the decision to construct a state-owned telephony network. In 1885, the private telephone network was bought by the "Eidgenossenschaft" with the goal of overcoming the comparably slow growth rates.
In 1920, the "Bundespost" and the "Telegraphen Direktion" were integrated into one national monopoly company known as PTT (Post, Telegraph and Telephony) (Swisscom 2003).

1.1.4 Consumer acceptance during the first period of telephone services

The economic implications of a regulated introduction of telephony services compared to the introduction of telephony services in an open market are difficult to measure, since telephony services were introduced in most of the observed countries as monopoly services. The most consistent set of data available was that on the spread of telephony services in the US. During the patent-protected era from 1880 to 1895 acceptance of telephony services was slowly rising. The period of competition following 1895 brought gains unimaginable just a few years earlier.

> *"After seventeen years of monopoly, the United States had a limited telephone system of 270,000 phones concentrated in the centers of the cities, with service generally unavailable in the outlying areas. After thirteen years of competition, the United States had an extensive system of six million telephones, almost evenly divided between Bell and the independents, with service available practically anywhere in the country* (Brock 1981)."

Industry historians Leonard S. Hyman, Richard C. Toole, and Rosemary M. Avellis summarise the overall effect of this period by stating, "It seems competition helped to expand the market, bring down costs, and lower prices to consumers." Figure 5 illustrates the growth of telephone service in the US between 1880 and 1920.

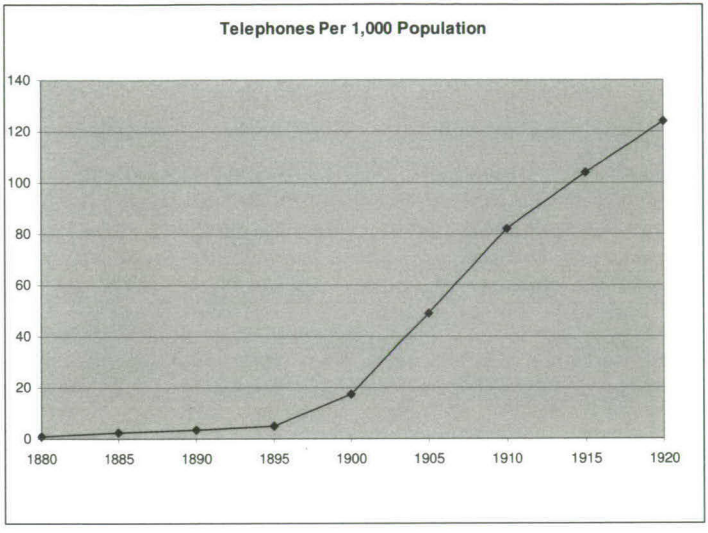
Figure 5: Spread of telephone service, 1880-1920

Year	Average Daily Calls Per1,000 Population	Telephones Per 1,000 of Population
1880	4.8	1.1
1885	13.3	2.7
1890	23.0	3.7
1895	37.0	4.8
1900	103.6	17.6
1905	258.7	48.8
1910	391.4	82.0
1915	446.0	103.9
1920	486.5	123.9

SOURCE: Hyman, Toole, and Avellis (1987).

Average daily calls increased 100-fold over the 40-year period, and the number of telephones increased from 1 to nearly 124 per 1000 population.
Figure 6 provides a graphical presentation of the data, in which the increase in the growth rate beginning in 1895 can be seen.

Figure 6: Growth of telephone installations



This growth occurred after the protection period of Graham Bell's patent ended. However, the data does not prove that deregulation was the reason for the growth of telephony services, as the shape of the curve is also representative for a typical lifecycle for the introduction and growth phase of technology services.

It would be incorrect to assume that the growth rate was purely a coefficient of competition following the expiration of Bell's patent. Other factors, such as the economic situation and consumer adoption rates during the early stage of a new technology, can also significantly influence growth rates.

This data clearly shows the significant growth in the acceptance of telephone services and the resulting importance on other markets as of the start of the 20th century.

1.1.5 Summary - The first period of telephony

Graham Bell invented the telephone in 1876. The technology spread within one year from the US to Germany, Switzerland and Austria.

In the US, Bell was able to build up monopoly services during the 15-year patent protection period, which was followed by a period of open markets.
In Europe, the situation was different, as telephony services were seen as an improvement of telegraphy, and which started as state-owned monopolies and remained monopolies until the 1990´s.

There is not much statistical evidence about the economic implications of monopoly services compared to open markets in the build-up phase of telephony services. In Europe, there are no comparable examples, and the periods of regulated and deregulated markets in the US can hardly be compared. The only known fact from that period is that growth rates of telephony users in the US were by far higher after Graham Bell's patent expired and competition intensified. However, there is no statistical evidence that this growth rate was the result of emerging competition. Economic, political and technology life cycles could just as well be reasons for the enormous growth rate.

1.2 The Classic Telecom Operator

I took the perspective of an incumbent telecom operator in Europe in formulating the strategic question for this book. The characteristics of telecom operators were similar in European countries, such as Germany, Switzerland and Austria. I will base the description of a classic telecom operator on the Swiss incumbent telecom operator and its organisation before deregulation (1996).

An organisation can be described on the basis of several factors, for example the organisational set-up, management and employees, geographical reach, customers, products, brands, and unique selling propositions or processes. The literature provides various suggestions on how to describe a company from the corporate perspective (Fischer & Lorenz 2000, Porter 1980). This chapter will focus on the telecom specific points relevant for the strategic question by setting them into the broader context.

Fischer & Lorenz investigated the typical incumbent telecom operator for the definition of the future European policy framework (Fischer & Lorenz 2000). They indicate that the incumbent is usually in control of:

- the local loop,
- strong customer relationships/contacts in the retail market, which is seen as a very valuable asset,
- the national tariff structure, and
- the cellular network and data infrastructure.

These characteristics make telecom operators unique and are characteristics in which they differ from other production companies. However, one specific factor that Fischer & Lorenz do not consider is the full vertical integration of the value chain for telecommunication services. Typically, a telecom operator dominates the market in every aspect of its value chain, and is a characteristic that is very relevant to this book.

To specify a business' strategy process, Porter recommends that an industry analysis on the description of a company be conducted. For this reason he introduced the five forces model (Porter 1980) and the value chain (Porter 1985).

The five forces model, which is based on competition, new entrants, substitutes, supplier power and buyer power, is of limited use in a monopoly environment. Competition, new entrants and substitutes were non-existent over a period of decades for the classic telecom operator. Suppliers of telecommunication equipment like telephones or modems were not allowed to enter the market. The monopoly situation in the telecommunications industry therefore reduces the five forces model to an analysis of buyers and customers to describe the industry.

Porter's other known concept, the value chain analysis, is important looking at the characteristics of telecom operators. Specifically the strong vertical integration from infrastructure ownership to service provisioning and customer contact is unique and has a strong impact upon the operator's corporate strategy process is. This section provides a description of the telecommunication value chain and the products supplied through that value chain. In addition, the international activities of Swisscom in 1996 are considered.

1.2.1 Definition of the telecom operator

Telecom operators design, build and operate telecommunication networks for households and businesses. Traditionally, corporations emerged from postal service organisations and were set up as national monopolies with a universal service obligation. Due to the growth of telephone and data services, the complexity of the industry increased and the importance and size telecom operators became more significant. Today, telecom operators are among the largest national and multinational corporations in Europe.

The size of the telecom operator in Europe has been primarily dependent on the number of households and businesses in the respective country. The table below shows the ranking of the ten biggest public telecommunication operators based on revenue in 1999. Operators' revenues, which were fairly stable in monopoly times, are, following deregulation, permanently fluctuating. Intense merger and acquisition activities, as well as divestments, are lead to a change in telecom operators' market position.

Figure 7: Top 10 public telecommunication operators

Ranked by 1999 revenue

Rank		Telecom revenue		Net income		Employees	
99	Operator (Country)	Total (US$ million)	Change (98-99)	Total (US$ million)	Change (98-99)	Total (000s)	Change (98-99)
1	NTT (Japan) a	97'953	6.7%	2'821	-46.0%	223.9	-0.2%
2	AT&T (United States)	62'391	17.2%	3'428	-34.5%	147.8	37.1%
3	SBC (United States)	49'489	7.1%	8'159	6.1%	204.5	2.1%
4	MCI Worldcom (United States)	37'120	104.3%	3'941	‡	77.0	-
5	Deutsche Telekom (Germany)	35'750	1.1%	1'309	-40.9%	195.8	0.0%
6	BT (United Kingdom) a	34'955	20.2%	3'264	-31.9%	136.8	9.7%
7	Bell Atlantic (United States)	33'174	5.1%	4'202	41.7%	145.0	3.6%
8	China Telecom (China)	27'539	14.5%	...	...	444.5	...
9	France Télécom (France)	27'344	10.5%	2'786	20.5%	174.3	3.1%
10	Telecom Italia (Italy)	27'229	8.2%	1'745	-12.2%	122.7	-1.1%

Note: United States dollar values are obtained by using operator supplied exchange rates or ending period exchange rate. Net income is after tax. ‡ indicates that Net Income was negative in 1997 and/or 1998. a Year beginning 1 April. b Year ending 30 June. * = 1997 data.

Source: International Telecommunication Union PTO Database. ©ITU, 2001. Last update: 14-Feb-01

Incumbent operators were traditionally called " PTT", based upon the combination of postal, telephone and telegraphy services, and the name of the country in which the PTT was based appeared at the beginning of the name, for example Swiss PTT. The

organisational set-up of telecom operators was originally nationally oriented and the headquarters were located in the country's capital. In addition, different departments handled postal, telecom and telegraphy services.

When deregulation became the subject of political discussions and it became clear that telecommunications markets would eventually be deregulated, change began.
In 1992, Swiss PTT underwent its first major reorganisation after forty years. The different nature and regulatory treatment of postal services, telephone and telegraphy (telecom) services led to an organisational differentiation. The units for postal services and telecom were separated from each other. Following the reorganisation, the telecom unit was named "Swiss Telecom PTT". With time, branding became more important, and "Swiss Telecom PTT was renamed "Swisscom", or "Swisscom AG", after going public in 1997[3].

[3] I will use throughout this book all versions of the name, depending on the timeframe I consider. The 2003 Swisscom company profile is attached as appendix to this section

1.2.2 Customer base

In a traditional retail business, the customer base dictates part of the positioning of the corporation. The success of today's retail business often lies in a strong customer focus and successful application of concepts like "One to One Marketing" (Gilmore et.al. 2000; Peppers et.al.1999 and "Customer Relationship Marketing" (Curry 2000; Brown 2000).

For a classic incumbent telecom operator, the situation was significantly different. The monopoly regulation and universal service obligation specified that telecom operators had to ensure that telecommunication services were reasonably accessible to all people within the geographical area regulated by the government. Tariffs had to be set on an equitable basis, regardless of where a citizen resided or ran his business.

Due to the monopoly situation, market share was 100%, with a growing penetration rate in the countries under study. In Switzerland, there were 4.2 million analogue exchange lines (Swiss PTT 1996) for around 3.5 million households and 300,000 businesses (Bundesamt für Statistik 2003). In the international context, Switzerland has traditionally had a high penetration rate for telephones and computers. All of the lines and related services were owned and maintained by Swiss PTT.

Customer segmentation, which in most cases is the key to successful marketing, was not necessary in a monopoly market. However, as competition increased, customer focus became more important. Competitors who enter a new market target the most profitable customer segments (cherry picking). Therefore, to protect its customer base, Swiss PTT implemented for the first time, in 1992, an organisation that addressed different customer segments, the first of which was the segmentation between residential and business customers, and multinational corporations. Today, these segments are addressed by several sales organisations, shops and partners.

1.2.3 Portfolio

There are certain products that are common among classic telecom operators. Swiss PTT's 1996 annual report lists six areas in which Swiss PTT was active [4](Swiss PTT 1996):

- Voice – Transporting voice over a fixed telephone network is the core business of a classic telecom operator and generated the majority of its revenues. Voice services include the connection of calling parties, physical connection of households, equipment maintenance, phonebooks, and information services. In 1996, internet services were also part of voice services, since the connection to the internet was done via voice dial-up lines.

- Customer Equipment – Customer equipment was the product area in which private automatic branch exchanges (PABX) for business customers were installed, leased and maintained.

- Data Services – Data services, the transport of data over different networks, evolved in the 1980's and 1990's with the growth of the computer industry. The networks were based on several technologies for specific purposes. Leased line networks made up the majority of data services, while X.25 [5] , IP[6], ATM[7] and Frame Relay networks were in the developing stage. Value added services, an add-on to data networks, are important value drivers today, but were less significant in 1996.

- Networks – The classic telecom operator used to own all of the infrastructure, from the local loop to the switch and the long distance cable. Swiss PTT differentiated between the units that provided the service to the customer and the unit that owned and maintained the network. "Networks" was the unit that set up the networks for voice and data services. This activity was the most capital intensive product area and provided the reasoning for the natural monopoly status.

- Mobile Communications – Mobile telephony was the highest growth area. As early as 1996, more than 600,000 mobile phones were sold in Switzerland, where the population was less than 8 million inhabitants. The mobile unit provided all of the services for operating the "Natel [8]" service in Switzerland.

- Radio and Television – Radio and television transmission was handled through separate networks. In the case of radio services, the PTT installed

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[4] Within this chapter I want to provide a short description of the areas and the important point from the strategic perspective. Technical explanations are provided in the Appendix "Telecom Definitions"

[5] X.25 =CCITT Recommendation X.25 - Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit

[6] IP= Internet protocol

[7] ATM= Asynchronous transfer modus

[8] Natel = Nationales auto telephone

and maintained the transmitter. The television channels were transmitted over the terrestrial network that was built so that the costs could be justified in the alpine regions. The PTT also collected licence revenues. Radio and television is not necessarily a telecom activity. In some countries, radio and television services were handled by other corporations. During the process of deregulation, telecom operators were forced to split their radio and television networks from their telecom organisation.

The above list is different than the hierarchy used by the EC for its monitoring of telecom operators (EU 2002 IDC). The EC uses the categories fixed telephony, mobile, internet, broadband, cable TV and leased lines.[9] A comparison of both hierarchies shows that most of the content is similar. The two hierarchies cover the same product areas and services, which is not surprising, given the underlying technologies and needs for interoperability on a global scale. Two major differences are worth noting here:

- Customer Equipment, a category of Swiss PTT, is not listed by the EC. The equipment market was liberalised several years ago and is no longer under the regulatory market perspective.

- The EC listing has a separate category for internet. In 1996, Swiss PTT's internet service was part of its voice product area, with 10,000 customers using analogue or digital voice lines to dial into the internet.

An interesting fact among telecom operators is that a single physical entity can serve multiple purposes and can generate revenues for different products. For example, based upon special multiplexing technologies, a fibre optic cable can simultaneously transfer numerous phone calls from fix and mobile users, as well as fixed data connections, and can also serve as part of the internet backbone.

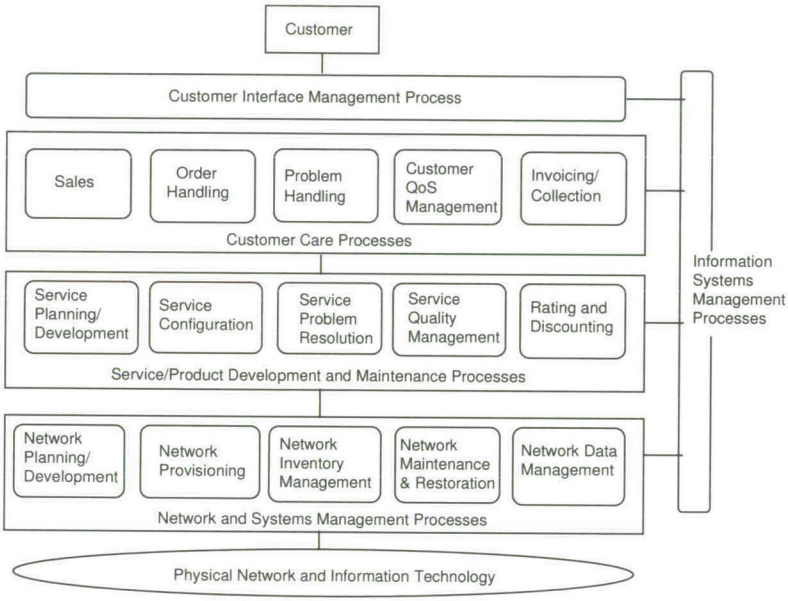
[9] For the technical definitions and complete description see Appendix- Telecom Definitions

1.2.4 Vertical value chain

This section looks at the primary activities [10] that a telecom performs so that a customer is able to use telephone services, transfer data, or watch TV.

All functions, from the management of the physical network to customer care activities, are completely vertically integrated at a classic telecom operator. The Network Management Forum (NMF) developed the "Telecom Operations Map" [11], that provides a standardisation for efficiency in information systems management. The figure below shows the different processes and resulting activities:

Figure 8: A simplified view of processes used by a service provider



source: Network Management Forum (NMF1998)

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[10] The term "primary activity" is based on the value chain definition from Michael Porter. He differentiates in the generic value chain between primary- and support activities.

[11] In 1995 Network Management Forum (NMF) produced 'A Service Management Business Process Model' (Ref.1) – a widely acknowledged document which described in high level terms how telecommunications service providers do business. It was produced for one key reason: to enable service providers to discuss and reach agreement on how to link their operational processes, specifically at the service management layer of the Telecom Management Network model. NMF has produced this document, initially as a consensus tool for discussion and agreement among Service Providers and Network Operators. Such consensus is the first step in:

- Defining an industry view of the processes and functions that make up the core of a service provider's operational environment;
- Providing an industry vision, to suppliers of management systems and software, of the environment within which their products will need to operate and interoperate;
- Enabling focused work to be carried out in NMF teams to define detailed information agreements (exchanges between applications or systems) and to review those outputs for consistency;
- Relating business needs to available or required standards; and
- Enabling applications builders and integrators to build management systems by combining 3rd party and in-house developments.

The telecom operations map describes in general terms the business processes of a telecom operator. The vertical integration of a complex value chain is one of the important characteristics to consider in a company's strategy process.

This section will provide an overview of the primary activities as a basis for the sections that follow. The second purpose the map serves is the identification of the interrelationships among the business processes. The model shows the different operational perspectives within the same physical entity. The processes are described below.

Customer Interface Management Process - This is the process directly interacting with customers. Within this process, all activities, such as sales, order- and problem-handling, or the creation of a trouble report, are translated in a form feeding the customer care process of different organisational units properly. Within these activities, customer contacts and direct inquiries are stored and the completion of action items tracked.

Customer Care - The "end-customer" is the ultimate buyer of a network service. In this process, customers can be connected with their services and products. The customer chooses his options for a telecom service. The activities involve direct interaction with an end-customer to provide, maintain, and perform the billing for network services.

Service/Product Development – The activities within this layer are generally "one step removed" from customer interaction, and are focused on service delivery and management. Based on the chosen technology, different services can be produced on a physical network. Sometimes this is created as an overlay network on existing networks[12]. The design and initial delivery is done on a one-time basis. Other activities, like service configuration at specific customers, are closely connected with the customer care process.

Network Management - These activities ensure that the network infrastructure supports the end-to-end delivery of the required services. As such, Network Management links between the physical network and the Service Management layer. Its basic activity is to collect information from the element management systems, and then to use itto support the business driven development of the network infrastructure. In addition, Network Management has its own responsibilities, for example, network provisioning and network fault management. The key issue is that management responsibility is placed at a level where adequate information is available, instead of shifting all responsibilities to Service Management.

[12] *For insider: The IP Network is created on top of the ATM or SDH Network*

Physical Network and Information technology - The "lowest" element is the physical cable. The copper and fibre cables are purchased and placed in the ground. The next step involves connecting the cables with active components so that signals can be transmitted from one end to the other. This process layer differs from the others in terms of added value, in that the equipment is not produced by the telecom operators. The equipment market is already deregulated and vendors like Lucent, Siemens, Cisco, Nortel and others compete for market share. From a regulatory perspective, the important differentiation of the physical elements takes place between the:

- access cable to the customer, also known as the local loop,,
- active devices, which are switches that allow for the routing of voice, data and video through the network and enable the communication between carriers (interconnection), router and storage devices, and the
- Backbone, which are long distance lines that connect switches between cities and can transport a huge amount of modulated voice and data connections. Competition was introduced first in this segment.

The following paragraphs describe these physical elements in detail:

Access, or the local loop, is the customer end for all multimedia services. There are multiple access networks deployed to reach the end user. Each network is designed using different technologies and materials to meet a specific purpose, for example:

- copper cable for fixed network telephony, which is used by telecom operators,
- a dense network of GSM antennas used by mobile operators,
- radio frequencies for mobile telephony,
- satellite networks for global telephony
- fibre for high speed metropolitan area networks,
- coax cables, which are used by cable TV companies to extend their services on those cables to telephony and internet in households,
- satellites for TV, and
- The push by electricity companies to begin providing multimedia services over the "Powerline" [13] as a separate multimedia channel into households.

Backbones connect the switching equipment to a full network. The standard infrastructure for current backbones is fibre optical cables. Traditionally, the cable infrastructure was owned and managed on a national level with shared connections to neighbouring countries. As discussed under the international

[13] Powerline is a new technology where data is transported over the electricity system. Alternative telecom supplier owning infrastructure for electricity supply want to use Powerline as alternative transport technology.

aspect of the classic telecom operator, several companies currently specialise in providing backbone infrastructure on a global scale.

Active Devices provide the distribution of all information between different customers, which physically speaking means between different access points. Different applications demand different types of infrastructure, for example between line- and packet switching, broad- or multicasting and individual connections.

- In a line system, the switching system provides an end-to-end line between access points for a specified period in time. The original telephone system is an example for line switching for individual connections.
- The internet is a packet based system which can provide multicasting as well as individual connections.
- TV channels are provided in a broadcasting fashion.

Current technological developments reduce the boundaries between the various types of switches in that packets can substitute lines and broadcasting systems can provide individual connections.
Another area of growing importance for switching equipment are "gateway" and "storage" functions. Gateways provide for the connection between different types of networks, for example from fixed network telephone users to mobile users and visa versa. Storage refers to applications and information that can be kept in the network, like Application Service Provider (ASP) and Internet Service Provider (ISP).

In network businesses, a transformation of information from one layer to another layer is necessary. Customer information has to be mapped to different services and in turn, service information has to be mapped to network information. In the event of a failure in a fibre optic backbone cable, several hundred or thousand customers can be affected. Or if it is necessary to obtain information about a specific customer, this information can be stored at several national and international locations from fixed networks, mobile networks, to the internet.

In 1996, all layers, from the networks and the products to sales and services, were operated within one company. At that time, telecom operators in Europe had full vertical integration, in which all activities within the value chain were operated as monopolies.

1.2.5 International aspects

All classic telecom services were delivered on a national level, but customer needs for telecommunication services are, in several ways, international. Telephone calls extend to international locations and international corporations must connect their various locations with data networks.
In 1996, being connected to a national monopoly operator still allowed one to place international telephone calls, since national telecom operators were able to provide international services despite their inability to build international networks.
In 1996, the system of international services was based on two different approaches:

The biggest portion of the business was built on legacy **international interconnection agreements**[14]. The demand for international cooperation emerged over a century ago to manage the first telegraph network. The provision of interconnection in regulated markets was already a major task with the necessity of international organisations to set the standards.

> *In 1996, Swiss Telecom PTT continued to play an active role in European and international telecommunications organizations. The main focus of its international commitments was on changes and adaptations to the new market environment* (Swiss PTT 1996).

The international cooperation between national monopoly operators has a long history. In 1865, telegraphy operators came together and created the International Telecommunication Union (ITU). The purpose of the ITU is described on their homepage in the following words:

> *The Union was established last century as an impartial, international organization within which governments and the private sector could work together to coordinate the operation of telecommunication networks and services and advance the development of communications technology (ITU 2003).*

This cooperation on an international level helped to create common standards that were used for defined points of interconnection between different networks. In 1996, as deregulation neared, it became clear that competition would emerge in most of the member states. The interconnection model needed to adapt to the new situation, on the one hand, for the new entrants without existing interconnection agreements, and on the other hand, for telecom operators who wished to build their own international lines. The shift in the interconnection system required a change in the role of the ITU and the national regulatory authorities:

[14] The economics of interconnection are discussed in 2.3.3

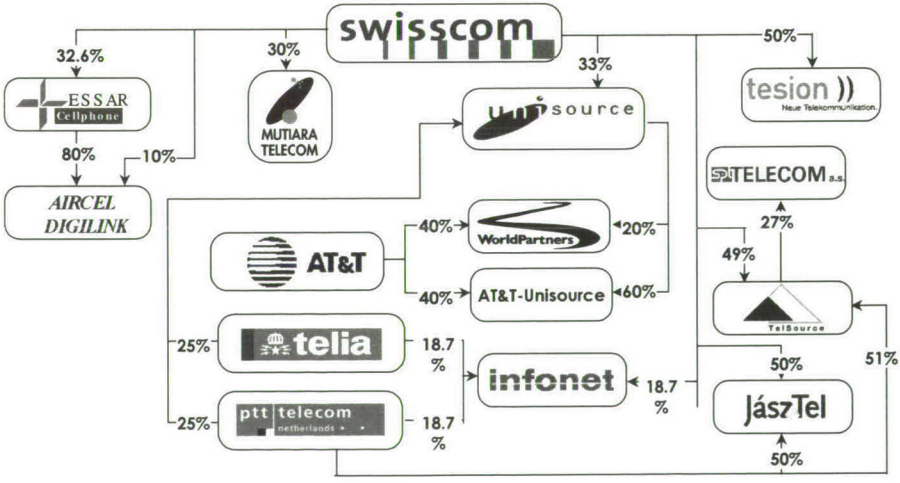
„At the same time, a fundamental evolution is occurring in assumptions and attitudes concerning the role of telecommunications regulation, largely driven by the globalization of trade, and the economic and social implications of convergence."(ITU 1997)

Monopoly operators had no experience within their market on how to deal with the deregulation of telecommunication services. From an interconnection perspective, it became clear that the number of participants and the complexity of routing through several networks would increase. Today, the development of a complex system of interconnections takes place on different scales, combined with an operator's own infrastructure This system is still in the development stage in order to enable real competition on the infrastructure level (IEC 2002).

"In reality, interconnection proved to be a financial and technical nightmare. In fact, the challenge of interconnection, more than any other factor, limited service providers..." (IEC 2002)

The second international solution, besides interconnection, was the opportunity to build up an **international presence**. Following deregulation, telecom operators had the right to enter international markets, and tried several strategic approaches.
Swiss Telecom PTT created, together with other national incumbents, a network of international holdings and incorporated companies with an international scope, such as Unisource and Infonet. The picture below gives an overview of Swisscom´s participations in 1998.

Figure 9: Swisscom international holdings



source : Swisscom AG

At that time, Swisscom had three kinds of participations.

1. There were mainly financial oriented participations like Essar and Mutiara. Growth opportunities were expected in emerging markets. Swisscom held minority stakes in these companies and supported them with the skills needed to operate a modern telecom operator. In return, Swisscom expected these companies to generate above average growth rates and financial returns.
2. The goal of the Unisource set-up was to create a global telecom company that provided global customers with what was called "seamless services". Unisource developed international voice- and data services with the help of the three parent companies Telia, KPN and Swisscom. Interesting at this time is the involvement of AT&T who got the same international needs but withdrew a year later forming an alliance with BT.
3. The third type of participation was the extension of the national home market in neighbouring regions with companies like Tesion. This approach was based on a high level of synergies in operating and selling telecom services. The geographical extension of these participations included the countries bordering Switzerland, where the language barrier was low and existing cross-border businesses could be long-term customers.

However, these participations were quite complex, due to different regulation and interests of participants. The set-up of the operations between the partners was in all instances quite difficult due to the lack of experience in managing international telecom business. Traditionally, telecom operators where technically oriented and faced difficulty in implementing international market-oriented organisations.

The sustainability of the chosen business models was highly uncertain and the financial return of the participations did not in all cases meet expectations. The period after deregulation was characterised by change through divestment and new investments. This is an ongoing process, as the following chapters will demonstrate.

1.2.6 Conclusion – Characteristics of telecom operators

The analysis of the classic telecom operator is based on the case study of Swiss Telecom PTT in 1996. The telecom operator has several significant characteristics:

- The classic telecom operator has a strong national position with a market share of 100% and ownership of the infrastructure, including the local loop to households. The residential, as well as the business segment, are dominated by the incumbent.
- The product portfolio covers a wide range of data, fix and mobile voice services. All services are infrastructure and transport oriented. The classic telecom operator provides no direct customer benefit in terms of content, CPE production or transaction.
- The value chain of the provided services is completely vertically integrated with a diverse set of activities, ranging from infrastructure- to customer management.
- International solutions are based on a complex interconnection system with no end-to-end control.
- The description of the international telecom is in an early development stage.

A look at the classic telecom operator in the context of the strategic question makes it clear that there is a need for action to compensate the loss in market share and revenues.
One of the strategic options to gain new revenue streams is the geographic extension of the telecom operator. The vertically integrated value chain with its infrastructure ownership makes it almost impossible for a telecom operator to expand "overnight" into other countries.

Experience with successful internationalisation in the telecom arena is limited. New globalisation approaches are needed to provide international solutions or geographical expansion of a telecom operators coverage.

1.3 International telecom deregulation

The push towards deregulation began in the US in the 1970s. The first business to be deregulated was the stock exchange brokerage commission in 1976. Thereafter, several, especially network based industries, were deregulated.The deregulation of the airlines in the 1970's and 80's, with its significant impact and scale, served as the case study for academics testing and the definition of new economic theories. The effects of decreasing consumer prices and increasing national competition were important drivers in the continuing deregulation of former monopoly protected markets.

At the same time as deregulation in the US was taking place, Europe was in the process of building up the European Union. This process was supported by the experience of deregulation theory in American markets, in which the deregulation models were used to create a uniform market and more competition within Europe. This evolution led to the deregulation of the telecom industry in 1998. The EU deregulated telecom services in all of its member states. In addition, 72 member governments of the WTO signed an agreement to liberalise international trade in telecommunication services.

The term deregulation is used in telecommunication-specific literature to describe similar political actions but different underlying intentions. Therefore, a fairly broad meaning of deregulation exists in the overall context. Below are some examples of the varying usage of the term deregulation:

- The WTO, which looks at the market on a global scale, explains that the objective is a "reduction of protectionism" (WTO 1998).
- The EU looks at deregulation from a positive standpoint by referring to it as the "introduction of more competition in the telecommunication market" (EU Jan1998).
- The Austrian telecommunications law states that the main goal of deregulation is an "implementation of the European law", without any mention of the market objective (Stratil 1997).

The examples show the different perspective on deregulation depending on the goal the organisations have. I will use the term deregulation in this book in a more generic way:

> *"Deregulation is the replacing of regulation with competition and market forces"* (Gillick 1992).

This definition considers the economical as well as the political changes in the telecom landscape[15]. However, the trend towards deregulation is not a generic trend, that is, there are several industries, in which the opposite effect to that in the telecom industry can be seen. For example, the health, safety and environmental area have faced a period of increasing regulation over the last few decades, despite the tendency of deregulation in several industries. Ronald W. Hanson states:

> *"Whether they like the result or not, most individuals view the past two decades as a period of substantial deregulation of American industry. Contrary to this popular view I would argue that this has not been a period of deregulation. Rather this has been a period in which focus of regulation has changed. (...) In contrast, during the past two decades there has been a growth in health, safety, and environmental regulation" (Hanson 1999).*

This statement is in line with the research of J.Luis Guasch and Robert W.Hahn, who have observed the costs and benefits of regulation. In 1999, they made the following statement regarding regulation and deregulation:

> *"The past two decades have witnessed two trends in regulation. First, there has been an unparalleled rise in new regulations related to health, safety, and the environment. Second, there has been substantial economic deregulation of certain industries in some countries, including airlines, trucking, railroads, financial markets, energy and telecommunications."(Hahn 1999:137)*

The telecommunications industry, which has evolved from a regulated market implemented as state owned monopolies, faces a clear trend towards deregulation. All deregulation actions taken on a national level have had an impact on international trade. National deregulation reduces the barriers of entry for international competitors. At the same time, national monopoly operators have acquired the right to enter new markets. Regulatory activities are spread over various geographical levels. Political institutions with both a national and international focus have developed initiatives with the same goal, namely an open telecom marketplace, for example:

- The Federal Communications Commission (FCC) controls deregulation in the US.
- The "Regulierungsbehörde" defines the rules for deregulation in Germany.
- The European aspect of trade is built up by the European Commission (EC).
- The World Trade Organisation (WTO) and Organisation for Economic Cooperation and Development (OECD) steer the process on a global level.

In the following sub-sections I will analyse the steps taken in different countries over the last three decades that have led to the global deregulation of the telecommunications market.

[15] I will look in detail in chapter 2 at the economics and regulatory concepts for the deregulation

1.3.1 Deregulation in the US

The US have been one of the drivers for deregulation over the last decades. The first deregulation step in the telecommunication industry was forced by the antitrust legislation. The split of AT&T was the result of an antitrust suit of the department of justice in the early 1970's and finally settled in 1982.

> *"though local service might continue to be a regulated monopoly, long distance and equipment markets were capable of being considerably more competitive. But AT&T's presence in regulated local services as well as in long distance and equipment allowed it to distort competition to its favor in these latter two areas"* (White 2000).

As a result AT&T was split 1984 into seven regional bell operating companies (RBOC), an equipment company spun off called Lucent today and the remaining AT&T with focus on long distance business.

The proactive side of developing markets and competition came into play with the Telecommunications Act of 1996. This was the first major change in the telecommunications regulation after 62 Years in the US. The 1996 Act update the 1934 act providing a new, national policy framework that relies on competition and market forces.

The deregulation of telecommunication industries followed the success of deregulation in the Airline and other industries. The Act was signed by President Clinton on February 8. 1996. The goal of the 1996 Act was described by the chairman of the FCC, Reed Hundt.

> *The message of the Telecommunications Act is that we are now committed to competition in all communications markets. (...) While the Telecommunications Act charts a path to competition in all communications markets, the FCC and the states together have to write the pro competitive rules that will make the new law's promise of new investment, job growth, lower prices, and better service for consumers come true. (Hundt 1996)*

This statement shows the commitment to the market perspective with increasing competition and ultimate goal of increasing the competitiveness of American consumers and businesses. This second step of deregulation was supposed to deliver eventually the benefits which were not achieved with the breakup of the Bell system and introduction of competition on long distance service (Taylor 1993).

1.3.1.1 The telecommunication act of 1996

The areas covered in the telecommunication act are including several areas of communication:

- *Telephone services including local, long distance and wireless*
- *Free, over- the – air broadcast television*
- *Cable television*
- *Content and programming on television and computer networks including the Internet* (Benton Foundation 1996)[16]

For telephone services the US authorities forced competition to achieve lower rates for consumers and to accelerate the deployment of advanced services throughout the nation. The implementation should take place on a state level, where interconnection and intrastate universal service is handled.

The activities should be implemented from Regional Bell operating companies (RBOCs) or Baby Bells and are supposed to enable competition in the telecommunication market.

The local telephone market had two areas with specific regulations. First the field of open network provisioning or interconnection:

- *Negotiate interconnection agreements in good faith;*
- *Provide interconnection to their networks on just, reasonable, and nondiscriminatory terms and conditions;*
- *Provide access to each separate network element such as subscriber numbers, databases, or signaling systems;*
- *Offer resale of their telecommunications services at wholesale rates;*
- *Provide reasonable public notice of changes to their networks; and*
- *Provide physical collocation (facility sharing), or virtual collocation if physical collocation is impractical.* (Benton Foundation 1996: 3)

The second point ruled for telephone services was the area of universal services.

> *"In general the FCC and state commissions are directed to promote in all regions of the nation services that are reasonable comparable to those services provided in urban areas and that are available at rates that are reasonable comparable to rates charged for similar services in urban areas"* (Benton Foundation 1996: 5)

For the broadcast spectrum the goal of the 1996 Act was the introduction of more competition through increasing the spectrum made available to broadcasters.

[16] I compared the Report published from Benton with the original Telecommunications Act of 1996, Pub. LA. No. 104-104, 110 Stat. 56 (1996). The Report is using the original wording but in a more readable text style

Besides the amount of spectrum it was also made more flexible for the broadcaster to offer new services like data and wireless telephone services and the procedures to receive licenses were relaxed.

The cable television network in the US has a wide coverage. Around 60% of the households subscribe to a cable television service and 90% of the households are passed by a cable. With the 1996 Act local phone companies are authorized to act as video service provider applying the new media on their network.

The most controversial part of the 1996 Act is the "Communication Decency Act of 1996". The liability of content is always competing against the free speech. In comparison to the other points the "Communication Decency Act" imposes stronger regulation rather than a liberalization of the markets. Active industry participants are not in favour of responsibilities and liabilities of content transferred over their networks. Therefore this section earned several discussions. Regarding my strategic question the topic has just minor importance, since the impact on the industry change is limited.

1.3.1.2 Predictions for the American telecommunication market

The Telecommunication Act of 1996 was an important event that changed the industry structure in the US, and provided Europe with the catalyst to initiate a similar deregulation of telecom services. The effects of deregulation already point in several directions.

The goal from a public standpoints lower service prices and a higher quality of service, which, if these are achieved, will lead to increased competitiveness of American businesses.

I see three major developments currently taking place:

1. The market will be divided into different competitive structures. The creation of wholesale markets and the pressures placed upon incumbents to offer interconnection support the development of specialised market players. There will be individual competition for long-distance services, switches or exchanges, and the local loop, although the local loop was not covered by the Telecommunications Act. Long-distance service providers have already emerged under the terminology of interexchange carrier (IXC). Local exchange carriers are being created under the name of competitive local-exchange carriers (CLEC), and local loop competition is coming from television and utility companies, as well as from wireless service providers (Hazlett 2000). The technology evolution, in parallel with the growth of wireless and the Internet, will support the differentiation of competition, which will create substitutes for current business models.

2. The US is one of Europe's largest trading partners. Communication services that support international trade are an attractive segment for entry in a competitive market. European telecom operators, as well as focused new entrants, are exploiting this market opportunity. This development leads to more competition and cash inflows in the US, further segmentation of the market, and lower costs for international trade.

3. Convergence of telecommunication services is slowly developing in the local loop. The Telecommunications Act gives providers the right to use television and telephone cables for multiple competing services. The technical development of interactive TV and Internet over cables and voice over IP support the trend of using one physical media as the broadband connection into the household. Eventually, one physical cable can serve as the universal access transporting all services, independent of the supplier.

1.3.2 Deregulation in Europe

Deregulation in Europe was quite different than in the US. Most of the European states maintained their telecommunications business as state- owned monopolies until the late 1990´s. One exception was the UK, which deregulated some parts of the telecommunication value chain as early as the 1980´s.
The main driver behind deregulation was the creation of a truly competitive European market through the European Commission. The first initiatives toward achieving this goal began in 1984, two years following the settlement of the antitrust suit in the US, which provided a benchmark during the first phase of deregulation in Europe.

In the individual states, there was a strong connection between the monopoly service provider and national technology producers (Lüthje 1997). For example, Deutsche Telekom had rights of exclusivity with Siemens and Alcatel, Swisscom with Ascom Hasler, and Telekom Austria with Kapsch. Siemens, Alcatel, Ascom Hasler and Kapsch were national equipment providers that were licensed to develop and produce telecom equipment like switches, terminals, and plugs and cables. The entire value chain was nationally integrated and secured through specific technology standards. These standards were often set by the dominant supplier, together with the telecom operator.

The European Commission had the vision of creating "the information society" that would drive the future economic growth of the European Union. To arrive at a European market in the information society, Dr. Martin Bangemann, member of the European Commission, identified two key issues for influencing forthcoming developments:

- *The first is convergence i.e. the blurring of frontiers between telecoms, audiovisual, computers and publishing*
- *The second is the irrelevance of geographical borders and distance as a result of global communications networks (Bangemann 1997).*

The legislation package from the European Union had the challenging task of developing the European Union towards the information society and integrating the changes arising from topics like convergence and globalisation.

1.3.2.1 The European Union in 1998

The European community established a two-step approach for the development of a common market for telecommunication services.

Step 1: In 1984, the first phase of community policy began with the aim of pushing the sector forward in order to establish a common line of development. Among the most important aspects of this early stage were:

- *the development of standards to solve the problem of national fragmentation created by different national specifications,*
- *common research under the form of shared programmes between operators and industry at the European level,*
- *the development of special programmes for the least developed regions of the European Union, in the context of structural funds, and*
- *initial tentative steps towards a common European position in the international telecommunications arena.*

Step 2: The market development, whose outcome significantly changed the industry structure, began in 1987 with the commission's publication of the Green Paper on the development of a common market for telecommunication services and equipment (EU Jan1998).

Based on the Green Paper, deregulation was designed to be implemented in all member states of the European Union. The work of the European Commission can be found in the "1998 Regulatory Package" (EU 1998). The European Commission focused on four areas to reduce the barriers to entry for new competitors. Specific directives were passed to the member states for implementation. The four areas are briefly described below:

1. Data Protection - The evolution of ISDN, the increasing significance of the Internet, and the growth of mobile networks demanded new directives for legislation on the processing of personal data and the protection of privacy in the telecommunications sector. With the internationalisation of these services, it became even more important to harmonise the standards for both sides of any communication. The directive specifies the rules for confidentiality in communications, traffic and billing data, itemised billing, directories, automatic call forwarding, and unsolicited calls (EU 1997/66).
2. Licencing - Under the Licencing directive, competition could be achieved by granting more licences in a transparent manner:

"Whereas under Community law and in particular under Commission Directive 90/388/EEC of 28 June 1990 on competition in the markets for telecommunications services, market entry should be restricted on the basis only of objective, non-discriminatory, proportionate and transparent selection criteria relating to the availability of scarce resources or on the basis of the implementation by national regulatory authorities of objective, non-discriminatory and transparent award procedures'(EU 1997/13).

3. Open Network Provisioning (ONP) - The Open Network Provision is intended to create an internal market for telecommunication services. There are directives on the ONP framework, interconnection, leased lines and voice telephony ensuring the availability, interoperability, and universal service of telecommunication services.

4. Terminal Equipment – The market for terminal equipment was liberalised stepwise between 1973 and 1989 (EU 1973, EU 1989). Today, much of the terminal market is a global market. However, technological changes, national protection requirements, and demand for standardisation drive this process as an ongoing regulatory task.

As a result of the directives, the telecom markets in all member states were deregulated in 1998. The next chapter will look at the economics behind the four regulatory areas.
The role of the European Commission in the deregulation process was to bring the member states to a common legislation, and to observe and oversee the implementation, including:

- *ensuring uniform transposition and effective application of Community legislation,*
- *assisting the transition to the regulatory framework,*
- *ensuring that adaptation of the legislation of public purchasing takes account of telecom liberalisation, and*
- *assisting the enlargement process by monitoring the relevant laws of the candidate countries (EU 2003)*

The political focus of these telecommunications-related activities , carried out by the European Commission, is set on the development of competition and the elimination of borders within the member states, as well as globally. There is no new regulation towards a future industry structure or social aspects in Europe's development towards the information society. (Esser 1997) The legislation became effective in 1998, and as a result, new entrants emerged in Europe. In addition, incumbents could extend their scope, and the process of convergence of telecommunication, publication, and broadcasting services began.

1.3.2.2 Deregulation in the member states – Example „Austria"

The member states in the European Union had to implement the legislation package in their country by the end of 1998. The status of this implementation was, and still is, monitored by the EC, and a status report is published each year. This section describes the regulatory actions that were taken on a national level in the case of Austria, which has been chosen for two reasons:

First, entering the Austrian telecommunications market as a competitor to the incumbent led to the strategic question for this work. In 1997, Austria was already late in the European deregulation process and Telekom Austria kept the barriers to entry high for competitors. However, the Austrian telecommunications market continued to develop. The rationale for Swisscom entering the Austrian market was the geographical and business connections to Switzerland. In addition, Austria and Switzerland share a common language, and the size of the Austrian market was closer to the Swiss market than other bordering countries, like Germany, Italy and France.

Secondly, the telecommunications market in Austria has a controllable size. Since 1895, the "Österreichische Post- und Telegraphenverwaltung" held the monopoly for tele-communication services. The liberalisation of this monopoly required extensive legal and organisational changes.

A new Telecommunications Act needed to be defined, an independent legal entity for handling the agreements and licences needed to be set up, and interconnection agreements needed to be negotiated. The new Telecommunications Act (TKG-Telekommunikations Gesetz) was published in August, 1997 (TKG 1997).

The TKG specified the independent control organisation that oversaw the implementation of the legislation. The so called "Telekom-Control-Kommission"* had several responsibilities, from controlling the licencing process, managing the universal service obligation fund and interconnection conditions, to the control of antitrust behaviour. The figure below lists the original wording including the references for the specific paragraphs (Telekom-Control-Kommission 2001).

Figure 10: Telekommunikationsgesetz § 111

Gemäß § 111 Telekommunikationsgesetz sind der Telekom-Control-Kommission folgende Aufgaben zugewiesen:

- Erteilung, Entziehung und Widerruf von Konzessionen sowie Zustimmung bei Übertragung und Änderungen von Konzessionen gemäß §§ 15, 16, und 23
- Genehmigung von Geschäftsbedingungen und Entgelten und Ausübung des Widerspruchsrechts gemäß § 18
- Ermittlung des Universaldienstfonds zu leistenden finanziellen Ausgleichs gemäß § 29

* After April 1st 2001 RTR GmbH took over the functions of the Telekom-Control Commission.

- Feststellung des an den Universaldienstfonds zu leistenden Betrags gemäß § 30
- Feststellung, welcher Anbieter gemäß § 33 als marktbeherrschend einzustufen ist
- Festlegung der Bedingungen für die Zusammenschaltung im Streitfall gemäß §§ 37 und 38
- Feststellung über die Nichteinhaltung des Quersubventionsverbots gemäß § 44
- Untersagung oder Auferlegung eines bestimmten Verhaltens sowie Erklärung von Verträgen als ganz oder teilweise unwirksam gemäß §§ 34 Abs 3 und 35 Abs 2

The completion of these tasks by the Telekom-Control-Kommission fulfils the EU directives required through the 1998 Regulatory Package. Austria was relatively late in the process of implementing the package. The European Survey of Information Society Project and Actions (E.S.I.S) states in their report:

> *"Austria has confined itself to implementing the necessary changes as late as possible, and with the least possible impact on domestic system. In other words the incumbent telecom operator's monopoly was fairly strongly protected for another period in time."*

The final report on monitoring EU telecom operators from 2002 provides a mixed picture of Austria.

Despite the fact that Austria was a "latecomer" in the deregulation process, the Telekom-Control-Kommission awarded nearly 500 public telecommunications licences from 1998 until August, 2001, for example:

> 70 for leased lines,
> 1 for analog mobile,
> 2 for GSM-1800 mobile,
> 2 for dual band GSM 900/1800 mobile,
> 3 for other mobile services ,
> 6 for 3G,
> 2 for paging,
> 67 for voice telephony, and
> 372 licenses for "notified services" which includes Internet access, Audiotext, and private sectors (IDC 2002:50)

In 2002, disputes were settled between the incumbent and newly licenced carriers about interconnection charges. Current issues of ONP directives include unbundling of the local loop and number portability.

1.3.2.3 Deregulation in Switzerland

Switzerland is a country in Europe that has remained independent from the European Union. However, international trade connections of Switzerland are an important factor for the wealth of the country. Swiss PTT was independent and integrated as a Post, Telegraphy and Telephone company beginning in1920.

The changes in Europe reached Switzerland slowly. It became clear that deregulation within the EU would become effective in 1998, and that the market structure would consequently change.

Deregulation discussions began in 1994 with the market-driven argument that Swiss PTT was the seventh largest provider of international telephone services. Its market position seemed too large to neglect the opportunities, but too small to leverage its own power (Syz 1997:55). As a response to international deregulation, Swiss PTT created, together with Telia and KPN, the international telecom operator Unisource. The EU did not approve the Unisource case, as there were no deregulation efforts in Switzerland. This was one of the events that triggered the government to initiate the deregulation process.
In 1996, the Swiss Parliament decided to separate Swiss PTT into two independent companies that would separately handle the telecom and the postal business. The telecommunications unit of Swiss PTT was renamed Swisscom, and the international expansion strategy was implemented.
In addition to the split of Swiss PTT, the parliament implemented revisions of four existing laws, namely of the:

1. Fernmeldegesetz (FMG),
2. Telekommunikationsunternehmungsgesetz (TUG),
3. Postgesetz (PG)
4. Postorganisationsgesetz (POG).

This package, whose content was similar to the legislation of bordering countries, allowed Switzerland to follow the trend towards deregulation in Europe and the rest of the world. Beginning January 1, 1998, competition for telephone services in Switzerland was allowed, and the current regulatory development is, in its structure and content, aligned to those within the EU.

1.3.2.4 Predictions for the European telecommunications market

The goal of deregulation in Europe is to create a unified, that is, European-wide market. This is one of the reasons that regulation required a much stronger effort than in the US to change market conditions in a comparably short timeframe. I expect that liberalisation within EU member states will eventually create a European market, in which the current segmentation by countries becomes irrelevant. European telecommunication operators are expected to grow from nationally focused companies to truly international corporations[17].

On a national level, competition is driving down consumer prices, increasing service quality, and pushing innovation. In the future, competition will increase its focus on specific elements of the telecom value chain. The ONP regulation guarantees access to facilities enabling focused business models. This will drive the fragmentation of the market, first on a national level, and then, to a consolidation of the fragments on an international level.

Switzerland and its bordering countries are all participating in the deregulation process, which will reduce the existing barriers in cross-border trade and communication, with the expectation of an increase in international activities.

[17] The globalisation drivers of the telecommunication industry will be discussed in detail in Section 3.3 and 4.4

1.3.3 Global deregulation - WTO/GATT

Until the early 1990's, there were very few international rules for trade in services. However, deregulation of national telecommunication services changed the global picture of the market. The rules for interconnection agreements developed by the ITU were no longer sufficient to handle the changes in the industry, nor was the ITU the optimal organisation for defining global rules for trade in telecommunication services.

The first important steps in establishing global rules for the deregulation of telecommunication markets came about through the GATT (General Agreement on Trade and Tariffs) in the "Uruguay Round of Multilateral Trade Negotiations", in 1986. This initiative "*carried out negotiations under the terms of the Ministerial Decision on Negotiations on Basic Telecommunications (NGBT) adopted at Marrakesh on 15 April 1994*". Further developments were driven by the GATT and the World Trade Organisation (WTO).

> *"WTO: The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters, and importers conduct their business."(WTO 2003)*

As a result, a common understanding for the needs of open telecommunication markets was developed. The initiative became binding with the signing of the WTO agreement to liberalise international trade in basic telecommunication services, effective February 5, 1998.

> *"The 72 WTO member governments, which have agreed to open their domestic markets to foreign companies, account for nearly 93 per cent of the total domestic and international revenue of US $600 billion generated in this sector annually." (WTO 1998)*

The framework for basic communication signed by the member states was to an extent similar to the directives passed by the European Commission. The topics covered were:

- Competitive safeguard
- Interconnection
- Universal service
- Public availability of licensing criteria
- Independent regulator, and
- Allocation and use of scarce resources

Some of the measurements defined in the framework were criticised, as they were not as detailed as some member states had wished (Fredebeul-Krein 1997). However, the goal of finding a common way to handle most global telecommunication services proved to be a major step forward. The implementation of the framework will demonstrate how effective the framework has supported the evolving process of global competition.

Besides the WTO, the process of international coordination in economic issues is strongly supported by the OECD. The international aspect of deregulation is described by the OECD [18]in the following terms:

> *"The case for open markets rests on solid foundations. One of these is the fact that when individuals and companies engage in specialisation and exchange, a country will exploit its comparative advantage. It will devote its natural, human, industrial and financial resources to their highest and best uses. This will provide gains to firms and consumers alike. Another gain is the strong preference of people in the world over more rather than less, freedom of choice."(OECD 1999)*

Both organisations support the development of competition in telecommunication and free trade of services.

[18] OECD: The OECD groups 30 member countries in a unique forum to discuss, develop and refine economic and social policies. They compare experiences, seek answers to common problems and work to co-ordinate domestic and international policies to help members and non-members deal with an increasingly globalised world. Their exchanges may lead to agreements to act in a formal way-- for example by establishing legally binding agreements to crack down on bribery, or codes for free flow of capital and services. The OECD is also known for 'soft law' -- non-binding instruments on difficult issues such as its Guidelines for multinational enterprises. Beyond agreements, the discussions at the OECD make for better-informed work within member countries' own governments across the broad spectrum of public policy and help clarify the impact of national policies on the international community.

1.3.4 Conclusion - The Global Deregulation in the Telecom Arena

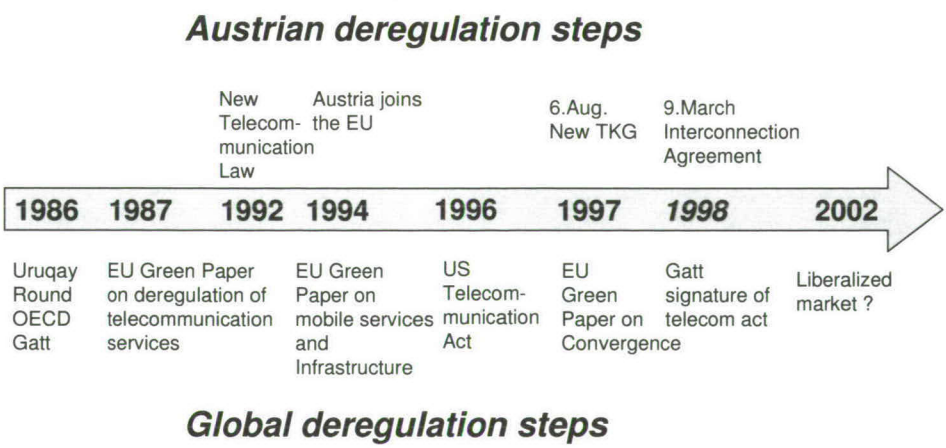
The patent for telephony was granted to Graham Bell in 1876. Since then, telephony services have spread and become one of the most important communication services. During most of the twentieth century, industry structure developed as national monopolies owned by the respective federal government. The industry set-up was characterised by the specifics of network-based businesses with the vertical integration of the value chain and national orientation.

Deregulation began in the US with the deregulation of the airline industry, and in 1984 with the split of AT&T. Deregulation was expected to bring about lower prices, better service, and faster innovation cycles, which would lead to increased competitiveness of the national industry.

Currently, deregulation is taking place on a global scale. International development is being directly addressed by the WTO and the EU. Their liberalisation efforts have been taking place concurrently and are changing the industry landscape significantly. New opportunities are being created and existing monopoly operators are, and will continue, to face competition.

The timeline below shows the recent development of deregulation from the Austrian and international perspective. The figure shows that the development is taking place simultaneously, that is, national deregulation is giving way to new international rules, and European directives are driving deregulation within its national member states.

Figure 11: Steps towards deregulation



2 Economics in network-based industries

The economics in network-based industries provide the basis for formulating international corporate strategy. This chapter will give insights into the current stage of economic theory in telecommunications regulation, as telecommunications is a network-based industry. The main emphasis is on the implications for the international corporate strategy process, which will be covered in detail in Part II of this book.

The developments of economic theory in the context of regulation and deregulation was not emphasised in the last century. This topic is discussed under the term "law and economics" in the academic literature. The title leaves it unclear as to who feels responsible for the underlying theories, that is, whether it is a legal problem for attorneys with some economic base, or if economists with an understanding of the legal issues of public policy should be responsible. A well-known attorney in the field of law and economics, Judge Richard A. Posner, states in the foreword of the "Encyclopaedia of Law and Economics":

> *" Few areas of legal scholarship remain untouched by economics. Apart from obvious examples – areas such as taxation and antitrust and securities regulation and other regulated industries..."(Posner 1999)*

One of his counterparts and an important source on the economists' side, R.H.Coase, supports this statement:

> *"The interrelationships between the economic system and the legal system are extremely complex, and many of the effects of change in law on the working of economic system (the very stuff of economic policy) are still hidden from us." (Coase 1990:31)*

The economic side bases its discussion on the founding work of A.C. Pigou.
His publication in 1920, "The Economics of Welfare", questions the role of public intervention in the following way:

> *"In any industry, where there is a reason to believe that the free play of self interest will cause an amount of resources to be invested different from the amount that is required in the best interest of the national dividend, there is a prima facie case for public intervention."(Pigou 1952:331)*

In his discussion about economic implications and how public policy can be changed to serve the public interest, R.H. Coase makes a pragmatic proposal:

> *"But the whole discussion is largely irrelevant for questions of economic policy since, whatever we may have in mind as our ideal world, it is clear that we have not yet discovered how to get to it from where we are. A better approach would seem to be to start our analyses with a situation approximating that which actually exists, to examine the effects of a proposed policy change, and to attempt to decide whether the new situation would be in total, better or worse than the original one."(Coase 1960:154)*

George J.Stigler, who was awarded the Nobel price for his work on economic theory about regulation, underlines those arguments in his summary:

> *An examination of the economic literature had revealed no serious professional attempt to measure the impact of public regulation in areas with long histories: the regulation of rates of electrical utilities; the review of new issues by Securities and Exchange Commission; and the antitrust policy of the United Stated. (Stigler 1982)*

Economic theory about the interaction between deregulation and economics in telecommunications has developed further since this publication. The old theorem of a "natural monopoly" for the telecommunications industry is differs between the individual elements of the value chain. The different activities are analysed applying contestability theory to see where markets still perform imperfectly and why (Bailey 1981, Baumol/Panzar/Willig 1982).

The areas with high barriers to entry, especially the infrastructure part of network-based industries, have received more and more attention. The conceptual models of how to deregulate and introduce competition in the telecommunications area have continued to develop (Bell 1998, Laffont/Tirole 2000, Shy 2001). However, economic theory in the deregulation process is still in the development stage.

> *The telecommunication industry has been changing rapidly for years, but academic research is still lagging behind. Telecommunication theory and policy lie at the intersection of regulation and competition, yet their study has often been treated informally, and important policy decisions have been and are being made on ad hoc reasoning in absence of clear guidance from economic theory. (Laffont/Tirole2000:Xiii)*

One of the reasons for the rather slow development in economic theory is the permanent conflict between different interest groups. The incumbent is trying to maintain its strong position against new entrants. Customers in rural areas demand affordable service, whereas urban business customers demand low rates on international calls, as well as high speed data access.

The discussion about these conflicts goes beyond the scope of this book. However, an excellent overview can be found under the topic "Deregulation: Ten Conflicting Priorities" in (BERGMAN et al. 1998:34-46)

The following chapters will first examine the economic reasoning as to why the telecommunications industry was handled as a monopoly for decades, then I will investigate the theories driving the current deregulation process, and finally, will draw conclusions for the corporate strategy process.

2.1 Regulation

Market-driven democratic states believe in international competition and market power, although experience has shown that markets are not always perfectly self-regulating in the public interest.

This was not always the case. During the days of mercantilism, a different opinion of how government regulation could improve the economy prevailed. The general belief was to maximize export and minimize import, which would increase the amount of money within the country.

The fundamental issues are based on Adam Smith's publication of the "Wealth of Nations"(Smith 1789), which provided the first concise picture of economic literature. Adam Smith's approach influence deregulation for the next two centuries. His economic approach, along with the development of network-based industries, gave way to several state-owned monopolies.

The role of public policy in today's democracies is described by Samuelson:

> *"There are three major public interest justifications of regulation. The first is to regulate firms to prevent abuses of market power by monopolies or oligopolies. A second major reason is to remedy informational failures, such as those which occur when consumers have inadequate information about the characteristics of important products like drugs or energy-using appliances. A third reason is to correct externalities like pollution - this is the subject of social regulation." (Samuelson 2001:345)*

The task that the government has to fulfil is quite complicated, and changing with surrounding conditions. In its legislation, the government needs to encourage businesses to perform as efficiently as possible, while at the same time protecting people and the environment, and ensuring competition at an optimal level. In Samuelson´s words:

> *„Regulation consists of government rules or market incentives designed to control the price, sale, or production decisions of firms"(Samuelson 2001:345)*

Groundbreaking analyses of the inefficiency of regulation were conducted by George Stigler[a] of the University of Chicago. His work was done in the context of the

[a] Stigler's thinking on government regulation was even more influential than his work on industrial organization. Because of Stigler's research, economists view regulation much more skeptically than their counterparts of forty years ago. His first article on the topic, coauthored with long-time research assistant Claire Friedland and published in 1962, was titled "What Can Regulators Regulate? The Case of Electricity." They found that regulation of electricity prices had only a tiny effect on those prices. But more important than this finding was their showing that one could examine the actual effects of regulation, and not just theorize about them. Stigler devoted his entire 1964 presidential address to the American Economic Association to making this point. He argued that economists should study the effects of regulation and not just assume them. In his speech he twitted the great economists of the past who had given lengthy cases for and critiques of government regulation without ever trying to

"Chicago School", together with Milton Friedman. Stigler questioned regulation and enforced the process of deregulation.

> *"The investigations of these problems, strongly reinforced by related work of colleagues and students, gradually forced me to confront a question that should have been obtrusively obvious at once:* ***why does the state engage in its regulatory activities ?***
>
> *The answer (at least for an economist) seemed to lie much less in the theorems of welfare economics or the prescription of traditional political science, than in the systematic examination of the self- interest of the various participants in political life. These participants, to be sure, operated under different rules and constraints than the traders in the markets, but that did not argue against using the powerful tool of economic analyses, the theory of utility maximizing behaviour. Once the economist can identify the cost and returns from various actions this theory allows him to make predictions of behaviour that have been reasonably successful."(Stigler 1982)*

Implications of the self-interest of all involved parties in the regulation and deregulation process undermine the importance of public policy analysis in firms' strategy process. Influencing politics to benefit the corporate strategy can be an essential part of strategy implementation.

The lack of economic experience regarding the effect of regulatory actions leads to the need for different approaches in defining strategy, which the following chapters will cover in more detail.

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study its effects. In Stigler's view things were not much better in the twentieth century. "The economic role of the state," he said, "has managed to hold the attention of scholars for over two centuries without arousing their curiosity." Stigler added, "Economists have refused either to leave the problem alone or to work on it."

2.2 Monopoly - Natural monopoly

To define the term monopoly, this book refers to one of George J. Stigler's last publications, in which he provided the definition of monopoly for "The Concise Encyclopaedia of Economics" (Stigler 2003). Based on his definition and the reasoning for monopoly, I will point out the specific issues in the telecommunications industry.

> *"A monopoly is an enterprise that is the only seller of a good or service. In the absence of government intervention, a monopoly is free to set any price it chooses and will usually set the price that yields the largest possible profit." (Stigler 2003)*

Telecommunication companies in the observed countries operated in the sense of Mr. Stigler's definition for more than half a century as monopolies. These companies owned the infrastructure to provide telephone services, and were the only seller of these services. However, telecommunication companies were under government control, which reduced their ability to charge any price they chose. The profits of telecommunication companies were returned to the government as sole owner of the company.

> *(...)"Why do economists object to monopoly? The purely "economic" argument against monopoly is very different from what noneconomists might expect. Successful monopolists earn extra large profits by raising prices above what they would be with competition, so that customers pay more and the monopolists (and perhaps their employees) gain. It may seem strange, but economists see no reason to criticize monopolies simply because they transfer wealth from customers to monopoly producers. That is because economists have no way of knowing who is the more worthy of the two parties—the producer or the customer. Of course, people (including economists) may object to the wealth transfer on other grounds, including moral ones. But the transfer itself does not present an "economic" problem. Rather, the purely "economic" case against monopoly is that it reduces aggregate economic welfare (as opposed to simply making some people worse off and others better off by an equal amount). When the monopolist raises prices above the competitive level in order to reap his monopoly profits, customers buy less of the product, less is produced, and society as a whole is worse off. In short, monopoly reduces society's income." (Stigler 2003)*

In the case of telecommunication companies, government intervention and even more government ownership was institutionalised, with the goal of providing telephony as a universal public service. Tariffs were set by the government in a conflicting public and government ownership interest. Lacking comparable data, it is difficult to determine if tariffs were set in the interest of society. However, what is definitely

known is that five years following deregulation in Europe, tariffs have decreased[19] and efficiency in all activities of the telecom operator's value chain has increased. However, the important result for society is the fact that a production factor with growing relevance – telecommunication services – has become less expensive, and therefore, the competitiveness of participating companies has increased.

> *(...)"Traditionally, monopoly was identified with a single seller, and competition with the existence of even a few rivals. But economists became much more favorable toward antitrust policies as their view of monopoly and competition changed. With the development of the concept of perfect competition, which requires a vast number of rivals making the identical commodity, many industries became classified as oligopolies (i.e., ones with just a few sellers). And oligopolies, economists believed, surely often had market power—the power to control prices, alone or in collusion." (Stigler 2003)*

The model of "perfect competition" is important to observe market failure. Today, in the case of deregulation of network industries, economic thinking has been enhanced by the theories of "perfect contestability", which are introduced later in this chapter.

> *(...)"If a society wishes to control monopoly—at least those monopolies that were not created by its own government—it has three broad options. The first is an antitrust policy of the American variety; the second is public regulation; and the third is public ownership and operation. Like monopoly, none of these is ideal." (Stigler 2003)*

For the network industry, the option of public ownership and operation was the preferred choice for decades. With the trend towards deregulation, preferences changed towards substituting the state-owned monopolies with competition and private ownership.

> *"A famous theorem in economics states that a competitive enterprise economy will produce the largest possible income from a given stock of resources. No real economy meets the exact conditions of the theorem, and all real economies will fall short of the ideal economy—a difference called "market failure." In my view, however, the degree of "market failure" for the American economy is much smaller than the "political failure" arising from the imperfections of economic policies found in real political systems." (Stigler 2003)*

Political failures have been viewed as critical issues in periods of monopoly as well as those of deregulation, which has been the reason why state independent institutions have been established in the deregulating countries to control the implementation of deregulation.

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[19] Local calls in Germany went down from 6 Cent in 1998 to 1Cent 2003, after the introduction of call by call for local calls. The difference was even bigger on Interantional calls. A 3 minute call between the Netherlands and Germany placed with Deutsche Telekom at the 1.1.1998 would cost 1,47€. Today (28.8.2003) it would be 6,9 Cent with a call by call provider.

2.2.1 Natural monopoly

The reasoning for monopolies has a unique history among network-based businesses. Railways, telecommunication, electric utilities, gas and water supply are all based on huge capital intense network infrastructures. Beginning in the 1920's, network businesses were covered under the term "natural monopoly" and protected by strong national regulations (c.f. 1.1). These so-called natural monopolies could exist for several reasons, including high barriers to entry and a lack of incentive for public services. Stigler defines "natural monopoly" in the following way:

> *"The main kind of monopoly that is both persistent and not caused by the government is what economists call a "natural" monopoly. A natural monopoly comes about due to economies of scale—that is, due to unit costs that fall as a firm's production increases. When economies of scale are extensive relative to the size of the market, one firm can produce the industry's whole output at a lower unit cost than two or more firms could. The reason is that multiple firms cannot fully exploit these economies of scale. Many economists believe that the distribution of electric power (but not the production of it) is an example of a natural monopoly. The economies of scale exist because another firm that entered would need to duplicate existing power lines, whereas if only one firm existed, this duplication would not be necessary. And one firm that serves everyone would have a lower cost per customer than two or more firms." (Stigler 2003)*

The huge economies of scale in telecommunication infrastructure exist for several elements of the value chain, which create barriers to entry for competing firms, who would need to duplicate the access to households, switching infrastructure, international interconnection agreements, and the other activities of the value chain. As will be discussed later in this book, economists changed their focus towards a more specific investigation of the activities within the value chain of the natural monopoly.

> *"Whether, and how, government should regulate monopoly is controversial among economists. Most favor regulation to prevent the natural monopoly from charging a monopoly price. Other economists want no regulation because they believe that even natural monopolies must face some competition (electric utilities must compete with home generation of wind power, for example, and industrial customers can sometimes produce their own power or buy it elsewhere), and they want the natural monopoly to have a strong incentive to cut costs. Besides regulating price, governments usually prevent competing firms from entering an industry that is thought to be a natural monopoly. A firm that wants to compete with the local utility, for example, cannot legally do so. Economists tend to oppose regulating entry. The reason is*

as follows: If the industry really is a natural monopoly, then preventing new competitors from entering is unnecessary because no competitor would want to enter anyway. If, on the other hand, the industry is not a natural monopoly, then preventing competition is undesirable. Either way, preventing entry does not make sense." (Stigler 2003)

The opposition from economists was one of the reasons for the rethinking by politicians and a change in regulation. The evolution of economic thinking initiated the process of developing new economic theories in the deregulation of network-based industries. However, there were at least two significant reasons to maintain network-based industries as monopolies.

1. First, the infrastructure that was already in place or was being built up for new services, like mobile telephony, was immense, which created high barriers to entry. If a new entrant was able to duplicate this infrastructure, it was expected that this would lead to a significant loss for the incumbent, whose profits went to the government as owner of the incumbent telecom operator.

2. Secondly, the incumbent telecom operator was required to uphold its universal service obligation for basic services like fixed network telephony, which ensured equal access for all residents of the country. If the market were to be self- regulating, methods needed to be developed to ensure the same degree of service.

Today, these problems are addressed in part, and the term "natural monopoly" is reduced to individual activities within the telecom operator's value chain.

Based upon the goal of introducing competition to an industry, an analysis of where in the value chain of an incumbent telecom operator the natural monopoly exists, and where competitors can enter, needs to be conducted. In the activities dominated by the natural monopoly, character-specific regulatory actions need to be taken for the introduction of competition.

2.3 Deregulation - Competition

In the 1950's and 1960's, economic theory about regulation developed further and the importance of competition grew with the globalisation of network-based industries. Economists preferred the models of perfect competition and minimal state intervention in business. This thinking influenced American politics. Under the Carter administration, the first major deregulation effort used as academic reference was the deregulation of American Airlines. Alfred E. Kahn, who was Head of the Civil Aeronautics Board (CAB) under President Carter, and responsible for the deregulation of American Airlines, is quoted as saying:

> *"We enjoyed the happy experience of the incipient deregulation proving good, in obvious ways, for the public and for the airline as well."(Kahn 1998:18)*

Ronald Reagan, who followed Jimmy Carter as president of the US, continued the trend towards deregulation. Under his administration, several other industries became deregulated.

For the most part, deregulation benefited consumers and industries. European economists and politicians followed. The institutionalisation of the European Union provided a perfect case for implementing the new thinking towards "perfect competition" for the former natural monopolies. The economic expectation was established in EU publications with the following terminology:

> *"Market forces produce a better allocation of resources and greater effectiveness in the supply of services, the principle beneficiary being the consumer, who gets better quality at a lower price." (EU 1996:3)*

However, not all deregulation efforts proved to be successful. California, the United States' most populous state, has become the poster child for electric utility deregulation "gone bad". A 1996 state deregulation plan, which was supposed to make electricity less expensive, resulted in vastly higher energy costs for consumers and businesses.

This case escalated in the winter of 2001 with the shutdown of several utility lines due to the lack of sufficient power. The increasing demand for electricity, a high level of sunk costs due to old, unreliable power plants, and a draught in the Pacific Northwest led to a shortage which increased the prices for energy. When deregulation became effective in 1998, wholesale prices in California rose from $22 to $600 in December, 2000. Consumer prices were fixed through regulation. The losses had to be carried by the utilities, whose rating was downgraded, increasing their cost of capital.

This downside movement reflected the necessity to change, as well as the risk of new consolidations. Peter Navarro states in "Electric utilities: The argument for radical deregulation", in addition to the benefits, two important risks:

- *"However, it is unclear what kind of industry will emerge from this period of change.*
- *Finally, ... , must develop a set of merger guidelines and an aggressive antitrust policy aimed at ensuring that ongoing mergers in the utility industry do not dampen competition. (Navarro 1996)*

The case of Californian utilities was the first major disappointment in the hype of deregulating infrastructure and network-based businesses. The examples of deregulation in several network-based industries show the complexity and difficulty of choosing the right regulation methods to create a competitive environment.

The deregulation of network-based businesses has to be carried out in several steps. The deregulation of the telecom industry continues to evolve, and should be understood as the first steps towards a competitive international market. The deregulation process is described in Bergman et. al. as three phases of market structure:

> *Phase 1 – Monopoly. Services are supplied by one firm and regulation is concerned with the prevention of monopoly abuse in retail markets*
>
> *Phase 2 – Monopoly and competition. Competition is gradually introduced into some or all markets and regulation focuses on: monopoly abuse in both retail and interconnect markets by dominant incumbents; emerging competition issues; and public service obligations.*
>
> *Phase 3 – Competition. Here competition is extensive and increasingly effective in some or all markets. Some light-handed regulation is needed, as in other competitive markets, to ensure fair trading practices and the maintenance of public service objectives* (Bergman et al. 1998:7).

Bergman et al. position the telecommunications industry in Europe in Phase 2, together with the electricity, railway, gas, and airline industries. From a regulatory perspective, Phase 2 requires industry-specific knowledge in the deregulation process in order to implement industry-specific regulation. This is in contrast to Phase 3, where the only regulatory tool should be competition policy.

From a corporate perspective, participation in public policy discussion is required at this stage in order to incorporate the developments in a company's business strategy process.

The definition of a sustainable international corporate strategy requires a long time horizon. Given the current developments and the developing economic theories, this book will focus on a Phase 3 industry picture, with the assumption that competition is effective and developed on an international scale.

However, in telecommunications, the tendency towards deregulation is clear, and a set of theories and methods are developed to handle the process of introducing competition.

Chapter 1 provided input into the specific actions taken in the deregulation process. These actions are summarised as four building blocks by Tom Bell and Solveig Singleton:

> *"Interconnection, equal access, unbundling, and industry structure are the four building blocks that determine how quickly facilities based competition will emerge once the telecom sector is deregulated."(Bell 1998)*

The underlying economics for the three blocks, that is interconnection, equal access, and unbundling, will be introduced in this chapter. The economists structure the problems slightly differently based upon general network characteristics and the introduction of competition in natural monopolies. Interconnection, including unbundling as a specific type of interconnection, is handled as one topic with all aspects of financing.

The last building block Tom Bell mentions is the change in industry structure. I will look at this topic as a generic industry trend in section 3.4, and in chapters 5 and 6, the change in industry structure is argued as one of the key issues for shaping the future corporation.

2.3.1 Contestable markets

The theoretical foundation of the first phase of deregulation has traditionally relied on the economic concept of "perfect competition". This idea has been enhanced by the concept of "perfect contestable markets". Contestable markets were proposed by Bailey/Panzar (1981) and Baumol et.al. (1982) on the basis of their analysis of airline deregulation in 1981/82.

Elizabeth Bailey defines contestable markets using two versions:

> *"A market is defined to be perfectly contestable if no price in that market can be in equilibrium when its magnitude is such as to enable an entrant to undercut it and nevertheless earn a profit. Thus, a market that is protected by substantial entry barrier is clearly not contestable, because the barriers permit an equilibrium involving monopoly prices and monopoly profits. (...)*
>
> *The second version of the formal definition of a contestable market is tantamount to a requirement that there be no sunk cost."(Bailey 1984)*

The application of the model in the deregulation process of integrated network-based businesses shows the strength of the model. When an industry can be segmented into independent components, it is desirable to take a differentiated approach to regulation, separating the portions lacking market power through sunk cost from the ones already contestable without regulation. For the telecommunication markets contestable analysis proposes:

> *"...regulatory policy should encourage access to local telephone systems on equal terms because of the large sunk cost associated with the provision of local services"(Bailey 1984)*

The regulatory actions taken in the telecommunications industry were concentrated on network infrastructure, and attempted to provide equal access to the facilities characterised through sunk costs. Regulatory authorities had to drive the negotiations for interconnection rates and to ensure that the obligation of the incumbent to provide access to the infrastructure at a regulated price was being carried out.

To position contestable theory within public policy and the strategy process, Bailey states:

> *"Contestability analysis can provide some framework for discussion of the issues surrounding local and long distance service, but it does not necessarily*

offer definitive answers. To the extent that the consent degree has succeeded in separating market characteristics by sunk cost and natural monopoly from markets that are reasonable contestable, the degree would seem consistent with contestability analysis. Similarly, contestability analysis favors the realization of economies of scope between telecommunications and computer services which the degree permits. (...)
However these uncertainties (economies of scope) reflect the critical importance of technological considerations in the application of contestability theory." (Bailey 1984)

Areas with high barriers to entry are defined based upon contestability analysis. Each activity of the currently integrated value chain is regarded as a potential stand-alone market. Contestable activities are opened to competition without the introduction of new regulation. The activities with high barriers to entry require specific regulation to enable competition. The critical areas analysed in the telecom industry are (c.f. 2.3.):

- Interconnection: Parts of the infrastructure are still seen as natural monopolies. The local loop, local switching functions and access to other international providers are areas with high barriers to entry. Several regulatory interventions enable competition by ensuring access for new entrants to the incumbent's infrastructure.
- Universal services: Basic telephone services are seen as basic infrastructure where all residents in a country require equal access. A specific universal service regulation ensures access for everyone.
- Unbundling of the local loop: Interconnection is the first step in providing access to the incumbent's infrastructure. However, long-term new entrants wish to differentiate themselves in new technologies and set the service point for specific service elements in a customer's household. Unbundling the local loop enables competition for residential customers.

The following sections will look in detail at these areas and analyse them in regards to their impact on the strategic question.

2.3.2 Infrastructure characteristics

Telecommunication networks are characterised by a large number of access lines connecting households and businesses to a switching network. The network is constructed from several nodes that are connected in a technically and economically efficient hierarchical system (c.f. 1.2.4), which eliminates congestion and overcapacity in the network, while providing the needed reliability through redundancy. Typically, the network planning department of an incumbent telecom operator assesses the technical necessity under the given constraints. During monopoly times, telephone services deploying network infrastructure was based on the vision of providing almost one-hundred percent of the country's residents with the most reliable service and the best technology.

Technology lifecycles are becoming shorter and shorter. New technologies multiplying the transmission capacity (wave division multiplexing via fiber optic cables) or increasing the switching capacity (Gigabit switches for Ethernet technologies) are enabling new services and demanding changes in the network infrastructure.

The economic picture for infrastructure investment has changed as a result of deregulation. The loss of monopoly returns, amplified by shorter lifecycles of the deployed technologies, places much higher pressure on telecom operators. The investment criterion used to be the physical lifecycle of the equipment. Today, the business case and lifecycle of the service offering are the decision criteria for investments in new infrastructure.

The investments for telecommunication infrastructure follow the principles of other network infrastructures.

Investments in network infrastructure tend to have two key characteristics:

- *They are irreversible or "sunk"*
- *The are indivisible or "lumpy" (BERGMAN et al. 1998)*

During the period of analogue telephony, the switches and cables building a telecommunication network were in the classic sense "sunk" and "lumpy". However, with deregulation, telecom operator and equipment producers saw the necessity to develop technologies that could be shared between several telecom operators to provide shorter economic life-cycles.

Cables buried in the ground represent a sunk cost, as it is not economically viable to remove them if they are no longer needed. However, cables do not necessarily need to be lumpy investments. Today, switches are developed so that cables can be shared by several users (in this context a user is a telecom operator). A fibre optic trunk, a connection via long-distance switches, is built by tying together several fibres to one

cable. For example, the high investment cost in cross-Atlantic cables is shared by several telecom operators, each of whom receive a set of fibres for its personal usage.

The same characteristics can be seen in the deployment of infrastructure for mobile networks. An interesting case is the change in regulatory rules for the infrastructure of UMTS networks. With the introduction of the new UMTS technology, licences were granted on the basis of an auction, with the condition that each mobile operator had to build his own network. The clear purpose was the introduction of competition on the network infrastructure. The operators paid excessive amounts of money for the licences with the expectation of a long-term high return on this investment.
However, the economic downturn altered the business case for UMTS. The investments in competing infrastructure on the part of several operators with the expected return could no longer be justified. The EU finally agreed to allow different mobile operators to share the cost of establishing the UMTS infrastructure.

The example of UMTS technology demonstrates how close the arguments and benefits between deregulated free markets and regulated monopolies in some areas are.

2.3.2.1 Network externalities

Network externalities arise when market participants have an impact upon each other, although they do not pay for any of the impacts. Sometimes called "network effects", or "positive feedback", network externalities provide the argument that the value of a network and the connection to that network grow with the number of participants. Bob Metcalfe, known as the inventor of the Ethernet and founder of 3Com, formulated what is known as Metcalfe´s Law. It is a rule of thumb once stated by Bob Metcalf and attributed to him by George Gilder[20]:

> *"The power of the network increases exponentially by the number of computers connected to it. Therefore, every computer added to the network both uses it as a resource while adding resources in a spiral of increasing value and choice."(Gilder 2003)*

One of the simplest examples for the explanation of network externalities can be seen in the deployment of telephone services:

> *"The telephone is of very limited use if only you and your best friend have one. If a whole town is on the system, it becomes much more useful. If the whole world is wired, the utility of the system is phenomenal. But in the pre-digital age, it could take many years for Metcalfe's Law to bear fruit. It was not until 1931 that telephone companies put a dial on the instrument, finally cutting the tremendous cost of employing switchboard operators and extending the reach of the system. First, telephone use had to reach a critical mass, or number, of users. So it is with any technology. Until a critical mass of users is reached, a change in technology only affects the technology. But once critical mass is attained, social, political, and economic systems change." (Boyd 2003)*

Network externalities serve as the explanation for the industry development of communication services. Telephony, Telefax, Short Messaging Services (SMS), and the Internet all follow the same rules. As soon as they reach a critical mass, the services begin to take off, and generate high returns for the telecom operator offering those services.

> *"The same is true of digital technologies. Consider the Internet. It reached critical mass in 1993, when there were roughly 2.5 million host computers on the network. By November 1997 the vast network contained an estimated 25 million host computers. With computing cost continuing to drop rapidly and this dominant computing network growing exponentially, the stage is set for a*

[20] The mathematical expression of metcalfe´s law is stated: If there are *n* people in a network, and the value of the network to each of them is proportional to other users, then the total value of the network (to all the users) is proportional to $n*(n-1)=n^2-n$. If the value of the network is $1 for each other user on the network, then a network size 10 has a total value of roughly $100. In contrast, a network size 100 has a total value of roughly $10,000. A tenfold increase in the size of the network leads to a hundredfold increase in its value. (Shapiro/Varian 1999:184)

social, political, and economic revolution. Moore's Law and Metcalfe's Law are in play. To achieve a dramatic effect on commerce, though, one more piece of the puzzle is required. Firms must see a transaction cost advantage that causes them to change their strategic thinking from the models of the past." (Boyd 2003)

These examples show the relevance of network externalities for the telecommunications arena. In the international corporate strategy process, there are at least two important issues to consider, namely:

1. The assumption that the incumbent telecom operator will enter any international market by buying or building part of the network on his own. The incumbent needs to make sure that his network will have the critical mass. This could be a simple issue of economies of scale, whereas positive feedback should not be confused with growth as such. (Shapiro/Varian1999:176) The characteristics of positive feedback translate into rapid growth or fall. Shapiro and Varian call this a "virtuous cycle", which needs to be captured in the positive direction.

2. The second important issues for international strategy are standards. Standards create enormous positive feedback loops. The Internet and SMS services could explode in usage, as everyone could communicate with everyone else. The interaction with other partners in communication networks is extremely high, which increases the importance of standards. Planning the strategy on the "wrong" standard can be disastrous, as the famous case of "Beta" video technology has proven.

2.3.2.2 Switching cost and lock-in

Switching cost is an important issue in which new entrants face considerable barriers to entry in a new market. Switching cost can occur in several instances brought about through contracts, training and learning, data conversion, search cost and loyalty costs (Shy 2001). Users of telecommunication services are rarely interested in changing something. For a new entrant to enter a legacy market, the incentives for customers to change their habits, or to adopt a new technology, need to be extremely high.

One of the key points discussed in regulation is the issue of number portability[21]. For example, telephone users do not want to change their phone number when they switch to another provider. Otherwise, the user's cost would have to be recovered in cost savings by switching to the new provider. Assuming that the services provided by the new entrant are partly dependent upon the infrastructure of the incumbent, it is hard to imagine that a new entrant could provide a user with lower pricing when they have to pay the incumbent a switching and interconnection charge.

Another area that assesses switching costs in international strategy is based upon the introduction of a new network that is incompatible with existing networks. Switching costs from an existing network to the new network could be extremely high. In many information industries, collective switching costs are the most important single force working in favour of incumbents (Shapiro/Varian 1999:184).

Current deregulation efforts in telephone services focus upon forcing interconnection agreements, which ensure that new entrants have access to the scale or critical mass of the incumbent and the number portability necessary to reduce the switching cost for the consumer.

[21] number portability = Telephone number portability is a service that provides residential and business telephone customers with the ability to retain, at the same location, their existing local telephone numbers when switching from one local telephone service provider to another. FCC Homepage :http://www.fcc.gov/cgb/consumerfacts/numbport.html

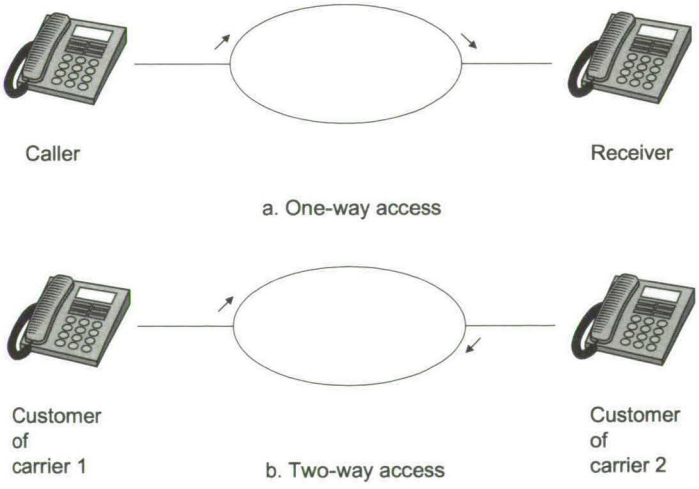
2.3.3 Interconnection

Interconnection, also called access provisioning, is necessary for international competition to exist in network-based telecommunication services (c.f. 1.2.5). Network access and service capabilities can be complemented with remote access and international connections to provide end-to-end customer service. Complementary services are common in telecommunication services and other network industries, as they provide the ability to extend the geographical reach and enhance services through, for example, convergence. This topic is also discussed using the terminology access pricing and bottlenecks.

Interconnection raises two different possibilities, which the graph below shows.

1. One-way interconnection is the provisioning of local access from the incumbent to new entrants. The new entrant may own the "caller"-end and wish to terminate on the "receiver" end. He will pay the incumbent the interconnection charge for terminating the call.
2. Two-way interconnection is the exchange of access on a bi-directional basis. In this case, both carriers own the caller and receiver end in their geographical territory. They exchange the calls, and revenues flow in both directions. Examples are international telephony or Internet peering.

Figure 12: Acccess types for interconnection



Source (Laffont/Tirole 2000)

2.3.3.1 One-way access

One-way access was the regulatory enabler that led to real competition in the heretofore mentioned countries. The access was granted to new entrants based on an interconnection agreement that the incumbent had to sign with the new entrants. Since the opening of the markets, emphasis has been placed on shaping interconnection agreements so that they are suitable for the incumbent as well as new entrants. The terms of the interconnection agreement define the ability to earn appropriate returns in the vertically integrated telecommunication market.

> *"With the vertical integrated industry structure, the vertically integrated firm operating the infrastructure also competes against the firms that have access to the infrastructure. The infrastructure firm, sometimes known as the "bottleneck provider", is in a position to act monopolistically against its rivals in the downstream sector. It could raise its rivals costs through setting an excessive access charge for use of the infrastructure, a practice known as foreclosure."(BERGMAN et al. 1998)*

An independent regulator was put in place to supervise the signing of the agreement between the involved parties, or to escalate a problem if one of the parties did not fulfill his obligation. Due to the different incentives of the incumbent and new entrants, discussions about interconnection pricing proved to be a complicated process which involved economists as well as politicians in the countries that were deregulated.

> *"Two factors make it difficult for regulators to set interconnection charges. First, regulators generally lack the information required for a good interconnection policy. Being understaffed, they know too little about the incumbents and entrants cost structures, about demand functions, and about the intensity of competition. Second, the high stakes attached to the interconnection policy in most countries generate intense lobbying by incumbents and entrants as well as political intervention.(Laffont/Tirole 2000)"*

One-way interconnection is a requirement for entering any nation's telecommunications market with telephone services. The lack of access to the incumbent's local networks creates high barriers to entry, and the infrastructure in place can be viewed as a sunk cost (c.f. 2.3.1). Therefore, one-way interconnection agreements have been the basic enablers for competition and one of the most important directives in the 1998 deregulation of the European telecommunications market. The next step in the legislative process is free access to specific elements of the value chain. Currently, discussions in member states of the EU concern the "unbundling the local loop". Unbundling is seen as the degree to which an entrant can pick and choose from the incumbent's infrastructure, the rules of which will affect the scope of activities in the value chain of a new entrant (*BERGMAN et al. 1998*).

2.3.3.2 Two-way access

One-way access dominated the discussions after the first round of deregulation. Two-way access was initially just important for international calls (c.f. 1.2.5) and fixed-to-mobile telephony interconnection. In both cases, calls could be initiated on both ends of the connection and each network needed the other to deliver the expected service. The growth of new entrants, combined with investments in infrastructure and convergence with broadband services, led to a growing importance of two-way access.

The Internet, which developed historically under competition, also had an approach for two-way interconnection called 'peering' between different providers and defined points where ISP's grant each other access.

> *"The telecommunication industry and regulators are currently defining principles for interconnection. Should it be a purely private matter, with operators agreeing on a wholesale transaction with a possible recourse to private arbitration in case of conflict, or should the regulator get involved? Should market forces be trusted to bring about efficient entry into the local market as well as competition-preserving agreements between established local operators?" (Laffont/Tirole 2000)*

The statement of Laffont/Tirole shows that the regulatory measurement and economic development of two-way access is still open. New technologies, such as UMTS and Wireless LAN, will create new regulatory challenges for two-way interconnection between telecom operators. Today, it is unclear if market forces or regulatory authorities should be responsible for ensuring that the market functions properly. Appendix I provides an interesting example of the company TOGEWAnet, which built its strategy upon market opportunities in the two-way interconnection between GSM and Wireless LAN.

2.3.4 Universal service

Universal service was the second reason for dealing with telecommunications as a natural monopoly. Besides the barrier to entry based upon the high investment cost of putting infrastructure in place for metropolitan areas, the government has the responsibility of ensuring equal access to basic services at an affordable price. The costs of access for rural homes are higher than for homes located in metropolitan areas.. Under the monopoly system, business users of telecommunication services subsidised those used by residential users *(Laffont/Tirole 2000)*. Long-distance and international calls subsidised local calls. Under these conditions, it was easy for new entrants to focus on the services that generated a surplus without the obligation to subsidise other cost-intensive services.

Regulating authorities have consistently been faced with the issue of how competition can be introduced, while simultaneously ensuring universal service. The WTO Agreement on Basic Telecommunication Services identified a minimal set of principles that should be followed by the signing countries. The principles were based upon transparency, non-discrimination, competition neutrality, and non- burdensome application. The European Community and its Member States have undertaken their commitment in the context of the WTO agreement. Similarly, the EU defines the scope and aim of the universal service directive with the following words:

> *"With regard to ensuring provision of universal service within an environment of open and competitive markets, this Directive defines the minimum set of services of specified quality to which all end-users have access, at an affordable price in the light of specific national conditions, without distorting competition."*(EU 2002/22)

The set of service is related to publicly available telephone services. The minimum set of services in the directive contains, besides the provisioning of access to the telephone network, issues like public payphones, directory services, number portability, quality of service, and itemised billing. The economic perspective on this topic has several dimensions, in which methodologies and legislation are undergoing review[22]:

1. Cost of universal service obligations
2. Financing of universal service obligations
3. Distribution of universal service support
4. Affordability of universal service

In any case, European Union member states ensure universal telephony services to their residents through legislation.

[22] The four problems and potential solutions are described in the Appendix-Universal service.

2.4 The future of telecom regulation

There were several effects from the first round of telecom deregulation in Europe.

1. The first effect was the creation of new companies that provided telecommunication services. A licencing process was introduced for the different kinds of telecommunication services. Figure12-Fixed-Telephony operators in Austria, shows the development from one monopoly operator to the current number of six fixed telephony operators. However, the five new entrants together accounted for merely eleven percent of the total fixed net revenues in 2001.

Figure 13: Fixed-Telephony operators in Austria

Operator	Geographic Coverage	Types of telephony offered (local, Long Distance, International)	Target markets (business, residential)
Telekom Austria	National	Local, LD, ILD	Both
United Telecom Austria (UTA)	National	Local, LD, ILD	Both
Cybertron	National	Local, LD, ILD	Both
Tele.ring	National	Local, LD, ILD, mobile	Both
UPC Telekabel	Regional	Local, LD, ILD	Mainly residential
RSLCom	Regional	Local, LD, ILD	Both

Source: IDC, 2002

2. The second effect was the set-up of companies who were awarded licences, thus creating a flood of local and foreign investment[23]. At the same time, this development led to an increase of labour, which in the short term, dried up the labour market. The author's own experience in the Austrian market has shown that it was very difficult to hire a skilled workforce at a reasonable price. Parts of the set-up process involved extensive marketing campaigns. As a result, marketing spending rose significantly. In 1998 and 1999, the telecom sector represented the industry sector with the highest marketing spending in Austria.

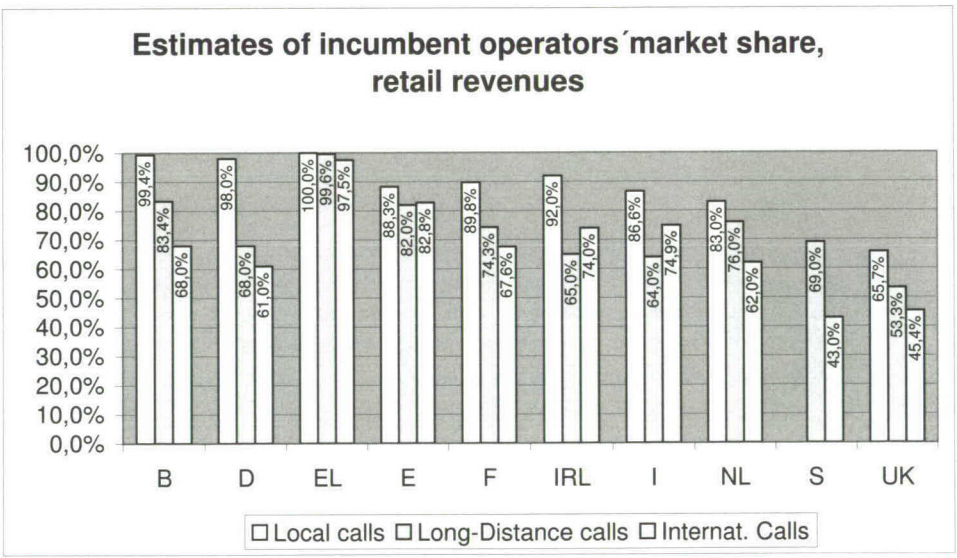
The third effect was the significant decrease in consumer prices for long distance calls, as competing firms underbid each other to gain market share.

[23] Foreign investors from Italy, Switzerland, Netherlands, and Denmark account for 29% of the market. (IDC 2001)

The growth of mobile services and the Internet hype occurred concurrent to deregulation. By the end of 2001, the European fixed telephony market accounted for 136 billion euros, compared to 99 billion euros in mobile revenues (IDC 2002:9). In comparison, mobile telephony revenues in the Swiss monopoly market accounted for just around ten percent of Swiss PTT's total revenue in 1996. New technologies altered the consumption pattern for telecommunication services.

The effects of deregulation, combined with new technologies, have resulted in strong growth of the industry as a whole. However, it is not known to which extent the coefficient of growth in telecommunication services is related to the deregulation process, or to technological innovation and customer acceptance.
What is known is the extent of business the incumbent has lost in that period.
Since 1998, competition has increased and the market has developed. The figure below shows how competition affected the incumbent's business four years following deregulation.

Figure 14: Incumbent operator market share



Source: IDC 2002

Competition was strongest in international voice business, followed by long-distance calls. The UK deregulated its telecommunication markets over ten years earlier. The diagram shows that the incumbent has the lowest overall market share, but still a significant position in the market. The experience of British Telecom (BT), the UK incumbent with the lowest market share among the European incumbents, is an indicator of how the markets are expected to develop in other European countries.

BT is now a telecom operator with a strong foothold in the international telecom market. The company's vision statement makes this clear.

> *"Our ambition is to be the best provider of communications services and solutions for everybody in the UK and for corporate customers in the rest of Europe, with global reach through partnerships."(British Telecom 2003)*

In terms of convergence, BT has extended its offer with initial trials of a "Digital office" to sell online content:

> *"Independent Portfolio, a new feature on the national newspapers popular web site that provides readers with the opportunity to buy unique commentary, in-depth reporting, archived material and crosswords, through the revolutionary online payment service, BT click&buy" (British Telecom 2003)*

The fragmentation and new consolidation expected to take place as a result of deregulation can be observed on the basis of current acquisition and divestment activities. In its 2002 Annual Report, BT lists seven acquisitions and eleven divestments in its attempt to develop the company's strategy (BT Group 2002). The example of BT is equivalent to that of incumbent operators. BT simply faced deregulation and competition several years before other European telecom operators.

The regulatory bodies currently have two major tasks to fulfil, both of which have arisen since the start of deregulation in 1998:

1. They have to ensure that deregulation directives and laws are implemented on a national, European and global level. To achieve this goal, a steady monitoring process needs to be put in place and adaptations needs to be developed. The first deregulation package led to a malfunctioning of the markets, or to dominant market positions.
2. The movement towards deregulation, combined with the changes in technology and ongoing convergence, have led to changes in industry structure. Therefore, the role and structure of regulatory authorities need to be adapted to the new industry structure.

2.4.1 Problems with current deregulation

The telecommunications industry has characteristics that make the deregulation process quite complex, and create new regulations to enable competition in what is sometimes seen as a natural monopoly. Alfred E.Kahn states that the telecommunications industry is more difficult to deregulate than the airline industry. The complexity of deregulation in the telecommunications industry is described in his article "Resisting the Temptation to Micromanage":

> *"The feasibility of competition is itself dependent upon rivals of the public utility companies having access, on non-discriminatory terms, to essential facilities that are under the control of the incumbent companies – electrical transmission and local distribution facilities, for example, and the local networks of the incumbent telephone companies, all of which continue, at least for the time being, to have the characteristics of natural monopolies. Moreover, the incumbent companies themselves continue to have unique obligations. Those obligations include extending service ubiquitously at rates that continue to be regulated and, especially in the telephone case, incorporating a gross regulatory dictated cross- subsidization of basic exchange rates."(Kahn 1998:20)*

A short, but significant statement supporting the views about deregulation in the United States is made by Thomas W.Hazlett.

> *"In truth the telecom marketplace is a big, complicated place, and the Telecommunications Act was a big messy bill." (Hazlett 2000)*

Both statements focus merely on the provisioning of infrastructure from the incumbent. The set-up and regulatory measurements are so complex that the incumbent has several possibilities to create barriers to entry for new entrants. Those barriers can be created on a technical, commercial, geographical, or service basis. Because of this, telecom deregulation earned a lot of criticism, which has influenced future activities and increased the number of involved parties.

However, experience has also shown that an independent regulatory organisation and a clear escalation procedure are necessary to solve these issues. To cope with these open issues, the FCC grew in its number of employees and in its importance. This is the opposite of what is viewed by the "Chicago" proponents as the ideal situation, who believe that the authoritative body should become smaller and eventually become obsolete.

Besides the regulatory and technical environment, the development of the industry and the involved players are critical issues. In her analyses, Gail Lawyer sees the

same problems arising from deregulation as from resulting merger and acquisition (M&A) activities. She states:

> *"The relentless rate of telecom industry M&A activity is reversing the original logic of underlying the 1996 Telecommunications Act: Instead of the competition influencing the industry to consolidate, consolidation now clearly is going to dictate the nature and degree of competition over the next few years.* (Lawyer1998)"

Consolidation is one of the future challenges for regulation. Consolidation is partly taking place on a global level, where the influence of national regulators is limited. This is an important aspect of utilities deregulation. New antitrust regulations and responsibilities need to be established to prevent global monopolies.

What becomes more and more visible from a regulatory perspective is that deregulation is an ongoing learning process and continuously interacts with technological changes and market forces. New regulatory actions are being undertaken to drive the development of competition in specific areas. The EC is applying contestability theory to analyse these areas and the need for further action. The publication of "Market Definitions for Regulatory Obligations in Communications Markets" (EU 2002 SS&D) states the temporary areas of interest. In the public press, the current battlefield in Europe is the "unbundling of the local loop", also called the "last mile problem".

This book will focus on the important long-term driver of the unbundling of the local loop. The short-term political and economic discussion is outside the scope of the long term strategy process that follows, so instead of a discussion, I would simply like to quote Stigler, who states that

> *"...the political failure may be stronger than market failures which could occur during the deregulation process". (Stigler 2003)*

The changes driven by deregulation and the emergence of new technologies are now challenging the existing regulatory system. On the one hand, the Internet has created its own market, where the role of public policy is still open. On the other hand, the convergence of industries and technologies are topics with which different regulatory departments are dealing.

2.4.2 Future regulation

The development of convergence in different markets and industries affects regulation, which is currently structured regarding to industry sectors. The fact that technology enables a corporation to transport voice calls over broadcasting infrastructure and video streams via the Internet, creates an environment in which different regulatory authorities would be responsible for one physical entity. In practice, there are several areas where it is unclear which regulatory method is relevant and which regulatory authority is responsible.
One of the first drivers toward re-thinking the legal framework in telecommunications was initiated in the Green Paper of 1987, in which it is stated:

> *„Die derzeitige Innovationswelle, ausgelöst durch die Konvergenz von Telekommunikations- und Datenverarbeitungstechnologie, hat dazu geführt, daß in allen Mitgliedstaaten Überlegungen über die künftige Organisation des Fernmeldesektors und die damit verbundenen notwendigen ordnungspolitischen Anpassungen in Gang gekommen sind." (EU 1987)*

In 1997, this aspect was developed further in the "Green Paper on the convergence of the telecommunications, media and information technology sectors, and the implications for regulation" (EU Com (97)623). These developments are under discussion by the regulatory bodies.

> *"In respect of communications infrastructure and associated services, convergence makes the traditional separation of regulatory functions between these sectors increasingly obsolescent and calls for a coherent and consistent regulatory regime."(EU1999/539)*

These discussions demonstrate the necessity for a regulatory treatment of convergence. The concepts used in the "Green Paper of convergence" are developed further in a study of the future of the EU regulatory framework (Squire,Sanders & Dempsey, Analysys 1998)

The convergence of the telecommunications, IT, media, and broadcasting sectors, as well as the changes in industry structure, are leading to the work regarding the next generation of telecom (de)regulation.

> *The first phase of reform has focused on industry specific telecom policy and regulation, with mixed results and generally slower than expected progress. The second phase, now being formulated in most countries, is influenced primarily by the experience to date and the rapid changes underway in technologies, markets and industry structures. This report examines the main*

alternatives being considered – ICT[24] *convergence regulation and multisector regulation* (Melody 2003).

The primary role of the existing regulatory framework in the EU was to enforce competition, and the most important issue was the introduction of competition by lowering the barrier for new entrants. This goal has now been achieved. Simultaneously, the market structure is changing, which requires a new regulatory framework on a European level.

> *The new policy framework needs to take account of these developments, in particular the convergence between telecommunications, broadcasting and IT sectors. It seeks to reinforce competition in all market segments, while ensuring that the basic rights of consumers continue to be protected. It is therefore designed to cater for new, dynamic and largely unpredictable markets with many more players than today.* (EU 2000/393)

The emergence of the Internet has posed an important challenge to the regulatory process due to the following issues:

- The Internet is a truly global communication system with no defined location or owner.
- It creates new markets and new services.
- It is unclear if there a regulatory framework required, and if so, how the framework should be designed.

Consequently, the European Commission requested a study in which the political framework and the positioning within the current political landscape are discussed.

> *"Applying or adapting the current regulatory environment raises the fundamental question of whether the Internet is included in the scope of current regulation".*
>
> *"Identify the impact of the Internet and the identified barriers on EU regulatory and policy framework for telecommunications*" (EU2000 F&L).

The actions taken by the EC and the proposals for the new framework support shaping the future of regulation that takes into account convergence and the problems arising through the Internet, rather than a multisector regulation. This development supports the position of Melody, who experienced multisector regulation, which was more strongly applied to developing countries due to "*major shortages of skills in the specialised technical disciplines of engineering, law accounting and economics",* while the regulation of convergence *"cannot be avoided" (Melody 2003)*.

[24] ICT= Information Communication Technology

Regulatory authorities and academics do not necessarily agree on the speed and quality of the current deregulation process. However, they do agree on a clear tendency towards further deregulation that considers convergence and the introduction of competition wherever possible.

The long-term goal of the deregulation process should be the self-regulation within the industry. Bergman et. al. specify Phase 3 of deregulation as:

> *"For network industries in phase 3, the regulatory framework should be much less complicated. For the most part, the only regulatory tool is competition policy, and this can be undertaken by an independent agency with considerable discretion." (Bergman et. al. 1998:136)*

In my discussion of the international corporate strategy process, I will project a Phase 3 status of the industry, which assumes the availability of access to all activities within the industry in an internationally open market.

2.5 Economics in regulation and international strategy

There are implications of the economics in telecom deregulation for the incumbent's international strategy. The home market of the incumbent telecom operator was protected as a "natural monopoly" over decades. In addition to regulatory protection, infrastructure characteristics, network externalities, and switching costs made the telecommunications industry a safe harbour for the incumbent.

The incumbent "owns" the infrastructure, service processes, and customer contacts. These competencies are a strong foundation, even five years after deregulation, for the development of international corporate strategy. The incumbent is still able to generate a substantial portion of his revenue in his home market. However, deregulation, in combination with the ongoing developments in new technologies, globalisation, and convergence, will change the role of the incumbent over time.

As a result of deregulation, the international market offers new opportunities, but also poses some barriers to entry and risks. For example, KPNQwest filed bankruptcy in 2002 and shares of Deutsche Telekom decreased sharply due to high debts from international acquisitions. These examples demonstrate the care with which international strategy needs to be defined.

To enable competition in a market that was formerly seen as a natural monopoly, the regulator needs to take a differentiated view of the vertically integrated value chain of telecom operators. Contestability theory provides the conceptual foundation for the differentiation of the individual areas.

- In marketing, sales, and service activities, barriers to entry are relatively low and competition can be introduced without the need for new regulations.
- The infrastructure-based elements of a telecom operator are high barriers to entry for new entrants. The regulation of interconnection, based on the incumbent's infrastructure, is the key element for introducing competition. At the same time, the universal service obligation by the incumbent has to be ensured long-term.

The public policy discussion in the last two chapters provided a detailed analysis on the mechanism of deregulation. The resulting changes are meant to increase competition, although it is unclear if this will lead to a long-term increase in the number of competitors on a global scale.

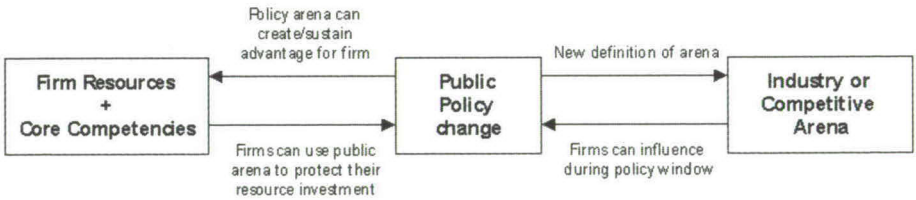
The deregulation process has not provided many insights into how industry participants should define their strategy, although an industry participant needs to understand the regulation process and emerging market opportunities in order to define his international corporate strategy.

What has become clear is that industry structure will change, competition will enter the market, and the success of new services is dependent upon reaching a critical mass that creates positive feedback loops. International investments in areas with large economies of scale are at high risk due to the potential of technological substitution and the question of achieving the necessary scale in a foreign market. In the telecom industry, this is typically the physical network, which is described in Section 1.2.4.

On the other hand, telecom operators can realise gains in areas in which they have already achieved the necessary scale in their home market. Returns are expected to be high where international demand for existing competencies is high and international deployment costs are low. Examples include all IT-enabled service features. To achieve a low cost position, the interconnection agreements, unbundling of the local loop, and the regulation of the universal service obligation should be part of a telecom operator's analysis for each potential country envisioned in its strategy.

Another important aspect not yet taken into consideration is the role of the involved parties that influence the deregulation process. The development of the industry, as well as the power and influence of the incumbent and new entrants, can change the direction of public policy. Ms. Bailey describes a model of how to position deregulation into strategy work (Bailey 1997). The important step Ms. Bailey takes is the separation and correlation between public policy, industry structure, and the firm's resources.

Figure 15: Integrating policy trends into dynamic advantage



Source: (Bailey 1997)

The figure above shows the model, which differentiates between the industry, the firm's resources, and public policy, and the interaction between these elements.

The next chapter will follow Bailey's model and turn to the industry arena, and will describe in detail the ongoing trends in the industry and their relevance for international corporate strategy.

3 Trends in the Telecom Arena

Up until now, this book has looked at the impact of regulation and deregulation upon the telecom arena. Changes within the telecom arena have not only taken place due to deregulation, but also due to other important developments.

For example, aggressive merger and acquisition strategies with big takeover battles, like the acquisition of Mannesman by Vodafone, or the merger between AOL and Time Warner, changed the structure of the industry and in 2000, led to intensive discussions in telecom and financial markets.

The change in market conditions beginning in 2002 created a new picture of the telecom arena. The downturn in the global economy led to the filing of Chapter 11 for companies like Worldcom and Global Crossing. In addition, DeutscheTelekom and Mobilcom were in the spotlight due to their excessive debts from acquisitions and large investments in order to participate in new mobile technologies (UMTS). Based upon these developments, cost savings strategies and divestments of earlier acquisitions suddenly became the focus of top-level management. CEO´s who were formerly well-known and respected for their visionary thinking and for their ability to implement their companies' visions through acquisitions were dismissed from their positions due to the bad results on their firms' balance sheet.

It is difficult to determine if the dramatic changes in technology and the global demand were the cause or the effect of deregulation. However, it became clear that technological changes supported the economic reasoning for deregulation of the telecommunications market.

> *"The shift to competition in all these countries was prompted in part by changes in technology but more fundamentally by the realization that users, and the economy in general, would benefit greatly from a broader range of services, of higher quality and at lower prices, in a competitive environment."(Kerf 2001)*

From a technological perspective, there were at least three major points supporting the change process, namely:

- increased possibilities to carry several "lines" via a single cable with ever growing bandwidth. (Wave Division Multiplexing).
- the emerging of the Internet, with its possibilities to substitute telephone services over IP-based networks.
- the need to finance new mobile networks and a significant growth in this new "market".

Global customer needs have grown over the last decades with the significant growth in international business and resulting communication and transportation needs. However, expensive telecommunication services could create barriers to entry or, at a minimum, a non-optimal situation for global corporations for the following two reasons:

- Expensive telecommunication services could be a decision criterion for the allocation of work in an international corporation.
- Expensive telecommunication services could also lead to technical substitution on a local scale. Classic telephony services can be substituted by "voice over IP" services, where merely Internet access fees, rather than international voice tariffs, need to be paid.

It is in the interest of corporations and governments to make telecommunication services affordable, and the reasons stated above show the necessity for regulatory bodies to find international rules for the regulation of telecommunication services.

3.1 Perspectives on telecom trends

Upon analysing the changes in public policy and by developing a foundation of the telecom arena, I can argue that the industry is unstable in its current form. In this chapter, I will investigate in more detail the developments that are reshaping the telecom arena and how these developments create a complex and uncertain environment where well thought-out managerial actions are necessary.

These investigated developments are seen as important changes long-term. I will use the term "trend" for these developments. Trends can be defined as developments that have a significant impact, but are statistically spread concerning the possible outcomes. The statistical spread is reflected as uncertainties about the scale and different directions of the trends.

After selecting the major trends, I will discuss the trends and their impact on international corporate strategy.

The following sections provide an overview of the major trends affecting the telecommunications industry. I applied several different techniques in order to collect these trends, in particular:

- A management workshop with a leading incumbent telecom operator
- Web research
- Literature research
- EU Publications

The resulting list is far from complete. However, as a result of the different perspectives on the same topic, I was able to select a set of trends which I refer to as megatrends. These trends account for most of the topics from a managerial perspective, and provide a clear picture of the facts and uncertainties in industry structure.

3.1.1 Telecom trends based upon the results of a management workshop

In 1998, I had the opportunity to conduct a scenario planning workshop at a leading incumbent telecom operator. One outcome of this workshop was the following collection of trends[25]:

Market:

Internationalisation and segmentation of markets

Convergence Telco/IT/Entertainment

Transport services as a commodity

Technology:

Development & migration of transport services towards IP

Development & migration of telephone and data services towards mobile

Convergence of equipment

Industry:

Long-term fragmentation of the value chain

Customers:

Increasing demand for value/ value added services

Price pressure upon telecoms

Service integration

3.1.2 Web research

A valuable collection of current market trends is also provided by leading market research institutions, which focus their research on topics where market needs are developing. A review of these institutions' websites provides an interesting overview of existing trends. Some of the known research firms in the industry environment include Forrester (2001), Gartner (2001), and Ovum (2001).
Gartner addresses the entire range of market players, and focuses its services on telecom industry players and policy makers, the new media industry, IT vendors,

[25] Methodology of the workshop: The workshop was performed with 10 attendees. The management team of the Enterprise Communication unit and the business development group selected in a brainstorming process a set of over 30 trends. The collecting was done with the basic question of what trend they think will affect their business in the following years. Each of the attendees could posture as much trends as seemed necessary. Out of those 30 trends a collective prioritisation of the trends with the highest impact to change was made.

e-commerce , the Smart card community, financiers focused on these industries, and adopters and implementers of IT.

These institutions focused their research on e-commerce, as they believed in its development. They saw the enablers for **e-commerce** through:

new devices, such as mobile terminals and smart cards,

new applications, such as cross enterprise integration and building e-commerce applications, and

new architecture, such as network infrastructure developments

The new developing services that they see include:

Call centre services

Internet

Cellular data services

IP

Mobile services

Personal assistant services

Unified messaging services

Competitive carriers

Value added network services

Access markets

Mobile e-commerce

3.1.3 Literature research: generic industry trends

The strategy literature provides generic trends currently affecting the global industry. A useful set of trends, which fits the multimedia environment, is provided by Prahalad and Oosterveld. They define the trends in "Transforming internal Governance":

The challenge for multinationals are the so called "Competitive Discontinuities". These discontinuities seem to be general market trends.

Prosumerism - More powerful, better informed customer

Disintermediation - The breakup of traditional channel structures

Deregulation, Privatization, and Globalization

Digital Convergence of traditional and new technologies

Indeterminate Competitive Landscape

Evolution to Open Standards

Zero Cycles - Shorter product life cycles

Ecological and Social Sensitivity (Prahalad 1999:31)

In their study, Squire,Sanders & Dempsey documented their understanding of how the multimedia market will develop. They came up with the following list of trends from an economic/commercial perspective. Current market trends, and how they may evolve with respect to network or other delivery mechanisms, include:

"The role of, and the relationships between, the various market actors in multimedia

The current multimedia strategies of fixed and mobile telecoms operators

Particular technological factors, such as the decreasing cost of broadband communications, the growth of the Internet and the multiplication of capacity channels made possible by digitalization.

Market structure issues, including the impact of alliances and vertical integration, especially as regards access to networks and services.

Impact of digital technologies on telecoms networks, especially in terms of their impact on network competition and access to networks

Pricing issues, with respect to consumer tariffs and interconnection charges, as well as for transport and content.

Standards issues with respect to interfaces, software and hardware, and, in particular, the influence or control potentially resulting from proprietary standards." (EU1998 SS&D:2)

3.1.4 European Commission publication

The definition of the multimedia market used in this document is based on the European Commission Green Paper on convergence. Following the current market and regulatory development, the European Commission published a telecommunications review in 1999, entitled: "*Towards a new framework for electronic communications infrastructure and associated services*".
In their "Rational for the 1999 Communication Review", the commission listed the following technological and market developments:

> *"Convergence*
>
> *Globalisation of technologies and markets*
>
> *Mergers and acquisitions bringing profound changes in the nature of the industry*
>
> *The Internet overturning traditional market structures*
>
> *Improvements in processing, access and basic transmission technologies*
>
> *Wireless applications entering all segments of the market*
>
> *Software re-configurable technologies enabling operators and service providers to tailor their services*
>
> *The development of technologies within the media sector"(EU 1999/539)*

3.1.5 Conclusion

The sources for the collection of market trends included academic literature, regulations and the industry research. All of these sources agree that the industry is undergoing fundamental changes that are influenced by technology, markets, and industries.
In a comparison of the different perspectives of the trends, all sources show that there is a high level of complexity due to a combination of changes in industry structure, technology, new customer needs or services, and the international scope of services. However, each source places a different emphasis on the trends and their impact upon the multimedia environment.

Market research companies are more technology-oriented. In the technology area, all players attempt to agree on the standards. These standards reduce uncertainties, which make the direction seem fairly certain, however, the main question is the magnitude of the trends.

Telecommunication operators arrive at the trends on the basis of daily management experience. Their focus is specific to their individual perspective. Part of the overall picture, especially the "other side of the convergences", is considered to a lesser degree.

The **literature** approach is generic, but proves that a particular development is not purely a telecom or multimedia development, since it is a "generic" increase of the complexity upon the market.

The **European Commission**, which looks at market trends from the regulatory perspective, focuses on a long-term industry view, which is based on intense research and based upon trends with a high impact. The perspective they have chosen serves the purpose of this book best. However, what is not covered in this set of trends is the deregulation of network-based industries, which has already been discussed as one of the enablers for future changes.

The following chapters will be based on EC research. As a result, the listing of trends in the EC 1999 Communications Review provides the basis for the investigation of the future structure of the multimedia industry.

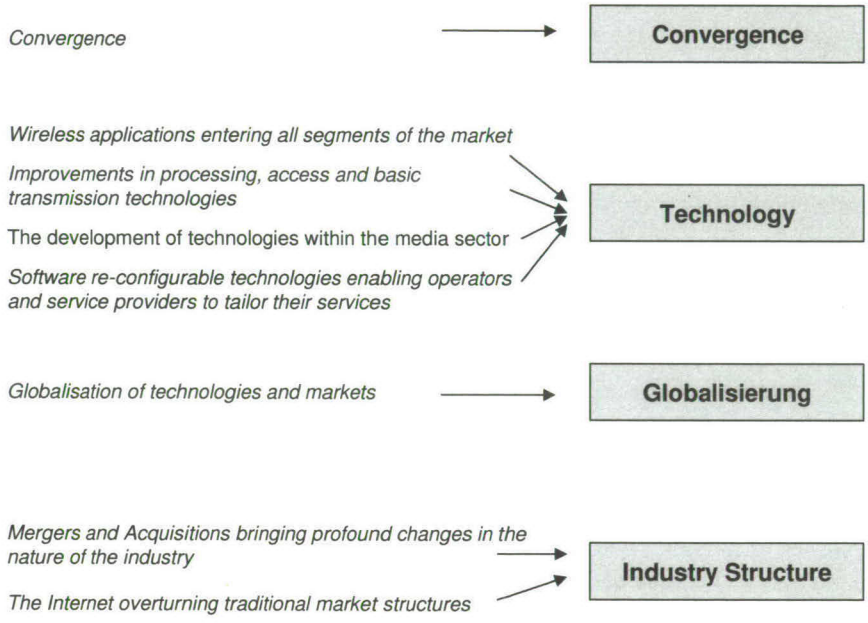
Some of the developments can be grouped under the same strategic theme, for example:

- "Mergers and acquisitions bringing profound changes in the nature of the industry" and "The Internet overturning traditional markets structure" are both occurring in parallel, thus changing the "**industry structure**".

- "Improvements in technologies", wireless applications", "software re-configurable technologies" and "the development of technologies within the media sector" are all evolutions in technology development. They will be handled under the trend "**Technology**".

The following sections will define the four trends, namely convergence, technology, globalisation and industry structure. The following figure gives an overview of these trends.

Figure 16: Industry trends



These trends are expected to redefine the telecom arena. The developments listed in the other sources in this section address the same trends, but with slightly different perspectives. The Appendix – Industry Trends gives an overview of the original listing of industry developments and the relationship to the selected trends.

The following section will investigate the four trends in more detail, thereby creating the foundation for further discussion. The basis for the analysis is the original "Communication Review" position paper. Further discussion should assist in understanding what effect the trends could have upon an incumbent and his future position in the multimedia industry.

3.2 Convergence

The discussion of convergence is based on technology, markets, industries and regulatory authorities. Convergence will have a significant impact upon industrial organisation, assuming it will occur to the degree discussed in this section.

One of the examples for converging industries is the merger between the internet service provider AOL and the media giant Time Warner in 2000. This merger provided strong signals to the industry that convergence was becoming reality. However, although the merger between AOL and Time Warner was one of the signposts of convergence, it has up until now not been able to demonstrate the benefits of convergence. In fact, discussions are ongoing to remove the "AOL" part of the name and refocus on the original core competencies.

At the same time, technology convergence is taking place, for which the fundamental changes in mobile telephones are an excellent example. Today, mobile devices are able to run PC-applications, have a digital camera included, and can be used as data and voice terminals over several different networks.

The term convergence is used differently, depending on the context. There are mathematical expressions and applications in all scientific fields. The general meaning of convergence is an "independent development of similar characters (as of bodily structure or cultural traits) often associated with similarity of habits or environment" (Meriam-Webster 2003).
The EU published a "Green Paper on the topic of convergence" to provide a basis for the discussion of future developments:

> *"The term convergence eludes precise definition, but it is most commonly expressed as:*
>
> *the ability of different network platforms to carry essentially similar kinds of services,*
>
> *the coming together of consumer devices such as the telephone, television and personal computer." (EU Com (97);623:1)*

In this book I will use the term convergence as it is expressed in the 1997 Green Paper.

The overall potential for and consequences of convergence upon our society are expressed in the EU's 1999 Communication Review:

> ***Convergence** of the telecommunications, broadcasting and IT sectors is reshaping the communications market, including convergence of fixed, mobile, terrestrial and satellite communications, and the convergence of*

communications and positioning/location systems. Consumer acceptance of these new services will determine the consequences for society in terms of economic development, job creation, cultural identities and social impact. (EU1999/539)

The first technical implementations of convergence within the telecommunications industry occurred in physical networks. The combination of varying content on one physical cable created an opportunity for cost savings and revenue enhancements, and as a result, economic pressure for continuing implementation.

> *"Despite this popular image however, any convergence of consumer devices is today much less real than network convergence. Telecommunications operators are already offering audiovisual programming over their networks (albeit on an experimental basis) and have become major players in the provision of Internet access, as well as backbone infrastructure." (OECD 1997)*

Industry experts, researchers, and consultants all agree that things are "coming together", but it is unclear on which level and how convergence will take place.

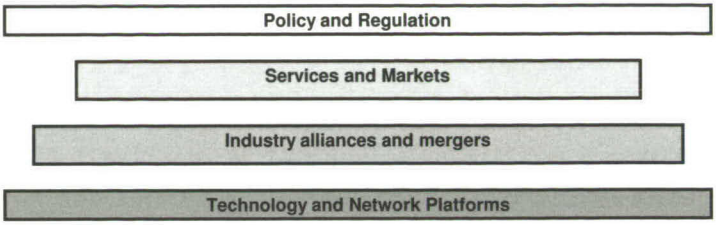
> *"Although things are clearly "coming together" in communications and computing, at the turn of the century the ultimate direction(s), outcomes(s), and timing(s) of change remain unclear because so many variables are at work." (Longstaff 2001)*

The impact of convergence on the industry will also affect regulation. For a structured analysis, the EU applied a model discussing the stages of convergence.

> *"The potential for change as a result of the phenomenon of convergence can be seen at three different levels (technology, industry, services and markets) though there can be no automatic assumption that convergence at one level inevitably leads to the same degree of convergence at other levels, nor that convergence in technologies, industries, services or markets will necessarily lead to a need for a uniform regulatory environment." (EU Com (97);623:2)*

All three aspects, namely markets, industries, and technologies are linked. Convergence will take place if the technology is available, and market demand will drive the development of the technology and the industry. The Green Paper contained a graphical representation, which is shown in the Figure below.

Figure 17: The stages of convergence



source: (EU 1997) [26]

The level "industry alliances and mergers" is part of the ongoing development of industry structure, and is discussed in section 3.5. Convergence in "technology and network platforms" is occurring in parallel with other technological evolutions and changes in our society. The element of convergence is part of this evolution and discussed in section 3.3.

"Service and markets", as well as "industry alliances and mergers", are elements where convergence has a direct impact upon the industry arena. In the next two subsections (c.f. 3.2.1/3.2.2), I will look at the topic of convergence as it relates to corporate strategy.

[26] The Figure implies hierarchies between the stages and different sizes. I could not find any justification for that. So I request from the reader to take it as a beautification.

3.2.1 Convergence and the multimedia marketplace

Industrial organisation and international corporate strategy are directly affected by convergence. Deregulation in 1998 provided existing telecom operators and new entrants with the opportunity to test convergence for IT, telecom, and media services on a national and international level.

The introduction to this chapter described the classic telecom industry. However, due to the impact of convergence, this definition will not hold true in the long term. The regulatory environment continues to change the boundaries for current telecom operators. The Green Paper, as the first step towards a converged information society, does not provide a terminology for the new industry. For the purpose of an open discussion, the Green Paper instead uses the term "new service".

Discussions about the developing industry do not use a unified terminology for that new industry, but rather, refers to the following three definitions from different sources:

1. TIME for telecommunication, information technology, media and entertainment is used by some consulting companies (Barnaby 1999).
2. ICT for the integration of information and communication technologies (Henten 2003).
3. Multimedia Industry for the converging telecommunications, information technology, broadcasting and publishing industries ((Squire,Sanders & Dempsey, Analysys 1998):2),

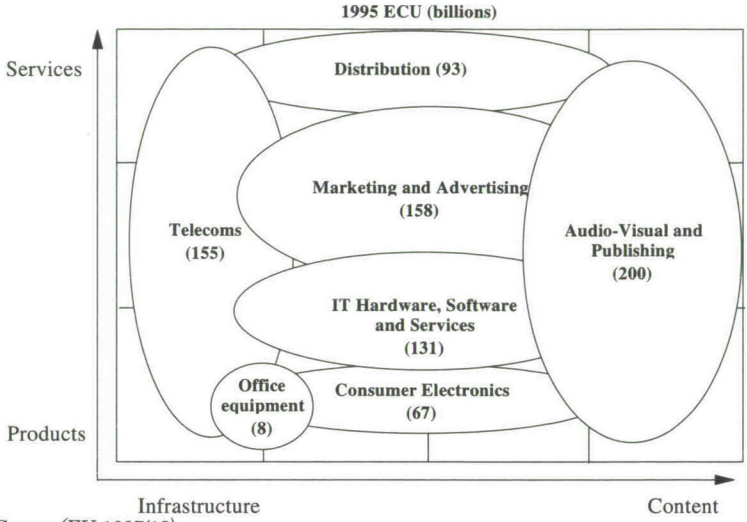
I will use the terminology "multimedia industry", which is also used by the authors of the introduced concepts.

The technical definition for the term multimedia is:

> *"understood to include information (e.g., text, sound, fixed and moving images and data) made available by the same medium, with which the user can interact."* (Squire,Sanders & Dempsey, Analysys 1998)

This definition assumes that the converging industries will lead to a significant new industry set-up. The figure below provides an overview of the current participants and their 1995 turnover in Europe. Traditionally, industries were strongly segmented through regulation. Telecom- and broadcasting regulation in individual countries, and the resulting monopoly positions in infrastructure ownership, created the two vertical segments for telecom operators. The IT, consumer electronics, marketing and distribution sectors are historically open markets and horizontally segmented.

Figure 18: Turnover in the converging IT, telecom and broadcasting sectors



Source (EU 1997/13)

Deregulation and convergence within and between the different industries are expected to change the picture and grouping of players. The evolution from individual industries towards a converged multimedia industry is generally accepted in today's discussions. However, organisational structure and details about how organisational structure will develop remain unanswered.

> *"The emerging multimedia industry.... Formed from the convergence of the telecommunication, computer, and entertainment industries, and facilitated by the digital revolution, it holds the promise of creating and capitalizing on an interactive "information superhighway." Yet there is no clear picture of how this futuristic industry will evolve." (Bane 1998:31)*

The development of the multimedia industry will not be driven solely by convergence, but rather based upon a combination of trends noted in Section 3.1, as well as by public policy. The following sections will discuss the other influencing trends in more detail.

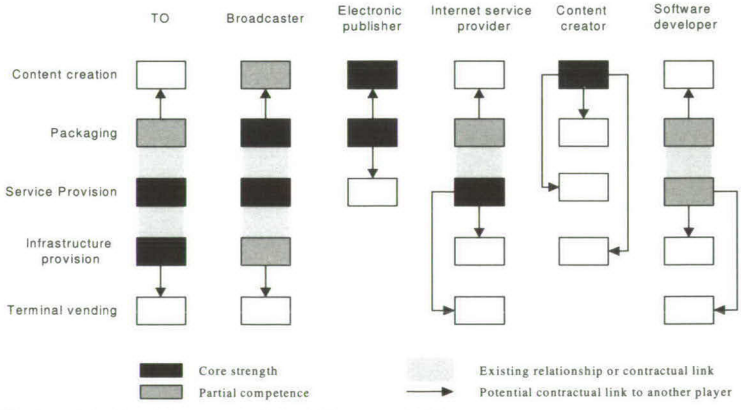
3.2.2 Convergence on the activity level

The convergence of services is expected to take place on different activity levels . It is assumed that convergence will happen on each level of the value chain.

- Broadband infrastructure based on packet or cell switching technologies is the underlying vehicle that enables services combining voice, data and video.
- Terminal devices like mobile phones will be enabled for different services.
- Service packaging may be a bundle of telephony, internet access and video.

A theoretical concept for the discussion of service convergence is provided in the Green Paper on convergence as well as in the "Study on Adapting the EU Regulatory Framework to the Developing Multimedia Environment" (EU 1998), will be introduced in this section and the methodology applied in this book.
The concept is based on the original vertical integrated value chains of various players in the multimedia industry. The value chains of the involved players are used as industry descriptions.
The following figure shows the vertical value chains of the players in the multimedia industry. The term telecom industry or market will be based on the "TO" = Telecom Operator position of the value chain[27].

Figure 19: Location of the major players in the value chain and relationship between them



Sources: Squires, Sanders Dempsey LLP and Analysys Ltd.

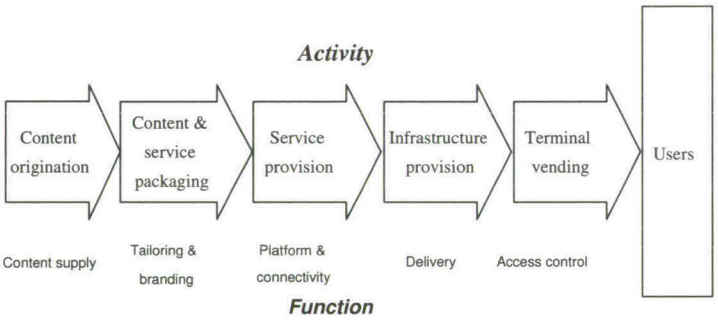
The entire industry is characterised by vertically integrated companies, from telecom operators to Internet Service Providers and media/broadcasting companies. The focus, from a telecom perspective, is seen in particular in the activities from "service

[27] The relationship to the „telecom operations map" from the NMF Forum is provided in the Appendix

provisioning" to "infrastructure provisioning". The former monopoly operator used to own the infrastructure and the management of the services, including the sales of terminal equipment and services. The telecom operator, being vertically integrated over the full value chain, is heavily involved in the convergence taking place at each level, but differently.

Squires, Sanders & Dempsey's and Analysys sees the future of the telecom industry as part of the converged multimedia industry. They propose a value chain for the future multimedia industry based on the individually converged activities. The new value chain contains the current activities of the telecom operators, broadcaster, content creators, and the other involved industries, and integrates these into the converged perspective.

Figure 20: The emerging value chain



Source: Squires Sanders Dempsey, Analysys 1998

This model provides an excellent basis for further discussion, and is seen as the definition of the multimedia industry. I will refer to it as the "multimedia value chain", following Squires Sanders Dempsey Analysis' terminology for the industry definition. This approach and level of detail supports the regulatory discussion. From a strategic perspective for a specific corporation, it is necessary to understand what the term convergence means at each horizontal level and how the individual activities will compete and eventually converge.

Bane et. al. provide their opinion about the impact of the converged multimedia value chain upon the industry structure in "The Converging Worlds of Telecommunication, Computing and Entertainment":

> *Thus, the multimedia industry is moving from a set of three* vertical businesses to a collection of five largely independent, horizontal industry*

* telecommunication, computer and entertainment

segments, namely: Content, Packaging, Transmission network, manipulation infrastructure and Terminals." (Bane et.al. 1998)

The hypothesis about an industry structure on the horizontal activity level is also described in the Green Paper:

> *"Many commentators identify a trend towards industry convergence, seen in alliances, mergers and joint ventures which build upon the technical and commercial know-how of the partners in order to exploit existing and new markets. Such alliances, mergers and joint ventures will continue to be subject to scrutiny under the Community competition rules. Many such alliances are 'horizontal', that is, between firms operating in the same part of the value chain. Those aimed at addressing the potential opportunities offered by market convergence generally involve companies operating in different parts of the value chain, resulting in increased vertical integration. Some of these alliances have met with early difficulties, illustrating the uncertainty of the Market convergence" (EU Com (97);623)*

On the activity level, the conclusion is that the emerged multimedia value chain will lead to the development of several new industries on the horizontal activity level of the converged value chain. A traditional industry analysis based on the current players would apply some quantitative methods to the individual activities. A limitation within this discussion is the quantification of the individual value-added activities.

Former value chains in the telecommunications and broadcasting industries were vertically integrated monopolies. The size of the total industries under regulated market conditions were known in detail in these vertically integrated structures. A horizontal perspective of the activities requires a split of the vertical revenues into horizontal activities.

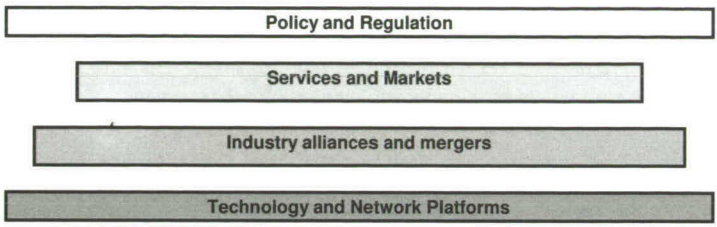
An example of the difficulty in quantifying the value of individual activities is the ongoing interconnection negotiations. The cost of placing a call over existing infrastructure is not transparent, and is leading to extensive discussions among industry experts. A great deal of research by the regulator, the incumbents, and new entrants is ongoing in order to obtain a favourable start position in the deregulated market.

Due to the significant impact of the changes taking place in the market, and the related uncertainties, it would probably be useful to quantify the value of the activities. However, retaining a focus on a qualitative, rather than on a quantitative level, may provide stronger results. Competition within the individual activities will eventually prove where the real value within the value chain is positioned.

3.2.3 Conclusion - Convergence

Convergence is currently being discussed in several industries and scientific areas. For the telecom industry, I will discuss convergence as it relates to the "multimedia industry". Within the multimedia industry, convergence is expected to take place on three levels, as well as to be driven by policy and regulation.

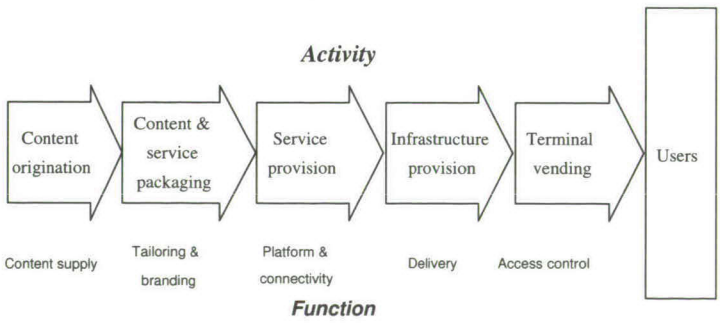
Figure 21: The stages of convergence



source: (EU 1997)

The main topic in this section is the convergence of services and markets within the perspective of corporate strategy. Academic literature provides input into altering the strategic perspective from the telecom industry to the emerging multimedia industry. An analysis based upon the multimedia industry is a future-oriented approach that will be supported by the conclusions arrived through the remainder of the industry trend analysis.
The development of multimedia services is visually shown within the multimedia value chain, which the figure below presents.

Figure 22: The emerging value chain



Source: Squires Sanders Dempsey and Analysys 1998

Competition within this value chain will take place on each horizontal layer. The uncertain aspects today include the kind of industry or type of competitor that will dominate the future multimedia industry, for example, if the dominant industry player will be horizontally or vertically integrated, and if the dominant player will have their geographical focus nationally or globally.

Another uncertain element is the quantification on the activity level. The turnover of the entire value chain is known, but it is unclear how much value customers are willing to contribute to each activity level. A precise quantification within the current stage of industry development cannot yet be achieved. Therefore, the focus for the strategy process will be on qualitative strategy tools.

3.3 Technology

The evolution of new technologies is driving change in the multimedia industry. The 1999 Communications Review states four technology trends influencing industry development:

- Improvements in transmission technologies
- Digital television
- Wireless applications
- Software reconfigurable technologies

These new technologies are the elements that will support the emergence of the global multimedia industry. The impact of these new technologies upon the future industry arena and the strategic question is the topic of this section.

3.3.1 Improvements in processing, access and basic transmission technologies

Improvements in computer and transmission technologies are evolutionary steps for the telecom operator. The ever-increasing speed enables the creation of new services and cost-saving opportunities.

> *"Improvements in processing, access and basic transmission technologies (in particular wave division multiplexing on optical fibers and digital subscriber loop (xDSL) technologies in local access networks) are reducing the cost and increasing the capacity of communications infrastructure. Computing power doubles every eighteen months, transmission capacity every twelve months. Hitherto uneconomic applications will therefore become commonplace as communications costs fall, radically changing people's work and leisure activities." (EU 1999/539)*

Two recent improvements in transmission speed include the introduction of xDSL via fixed networks and the evolution of the second generation of mobile data transmission, GPRS, towards UMTS. Internet access over xDSL is replacing the traditional access over analog or digital telephone lines[28].

The introduction of GPRS on GSM phones increased data transmission speed by a factor of 4 (from 9,6 Kbit/s to 40Kbit/s. UMTS will eventually go up to 2Mbit/s).

The trend towards higher speeds with new technologies is leading to changes in the industry, which create both opportunities and risks for telecom operators.

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[28] The German implementation of xDSL enables transmission speeds of 1.5Mbit/s transmission compared to 64 Kbit/s for a single ISDN channel. An increase of 25 times in speed)

The increase in speed among processing and transmission technologies significantly reduces the production costs for telecommunication services. An incumbent can already apply these technologies, as it has access to a broad customer base, thus achieving the necessary economies of scale. However, at the same time an incumbent has in place legacy systems with a high sunk cost, which reduces its ability to switch to new technologies.
In contrast, new entrants can base their offering on a lower cost structure, since they do not have legacy systems. This allows them to be more flexible than an incumbent.

An additional problem for the incumbent that concerns improvements in technology is customer switching behavior, also known as churn rate. In general, customers avoid changes to a new technology due to the switching cost involved. If the value of the new technology exceeds the cost of switching, customers will evaluate not only the new technology, but also the supplier of the new technology. This situation creates market opportunities for new entrants.

The introduction of new technologies, as part of the market entry strategy into new countries, can also provide a new entrant with a cost advantage over the incumbent. However, the timing between technology deployment and customer acceptance is crucial.

3.3.2 Technologies within the media sector

During the last few decades, the media sector was characterised by analog television and radio technologies. In many cases, the cable network for transmitting television channels was owned by the local telecom operator. This was the case in Germany and Switzerland, while in Austria the market was highly segmented, with two-hundred sixty cable network operators (Mensdorff-Pouilly 1997).

As a result of deregulation of telecom services, the incumbent telecom operator was required to sell the majority of its ownership in television cable to enforce competition in the market.

At the same time, this technology emerged, and digital television and radio are now the envisioned future within the media industry.

> *"The development of technologies within the media sector, in particular digital television (DTV) is providing a wide range of innovative services for both pay TV subscribers and free-to-air viewers. These include transactional "on demand" services and other new services such as digital teletext, Internet and e-commerce." (EU 1999/539)*

The digital infrastructure will be a source of cost reduction and new revenue creation for the network operator.

The transmission of digital, rather than analog, signals will enable network operators to send almost ten times the current amount of channels over the same infrastructure, resulting in significant savings in the transmitter cost structure.

Digital technologies also create opportunities to provide other services like Internet and telephony over the same infrastructure. This technological change will create competition, the goal of the regulatory institutions (c.f. 1.3), and will support the trend towards convergence with underlying components (c.f. 3.2).

One of the regulatory activities to introduce competition was the separation of ownership for cable TV networks and telecommunication infrastructure. The telecom operator was required to sell its TV infrastructure to other market participants, which weakened its home market position. Assuming that convergence is taking place, technologies in the media sector are an area to watch in terms of substitutes and new entrants* rather than direct competition.

The uncertain elements are the consolidation in the cable network market and in the emergence of the digital technology chain from transmission over receiving towards terminals, and which of the competing technologies will win.

* Based on Michael Porter Five Forces

3.3.3 Wireless applications

Wireless applications are growing in all voice and data segments. The enabling factors for real mobility are reaching a stage where user acceptance exists to a broad extent. The growing coverage of mobile antennas, the increasing capacity of rechargeable batteries, low power consumption devices, and high speed transmission technologies are creating the value networks for successful implementation of wireless applications Christensen 1997). (The commercial factors applying network externalities have reached the critical mass for the market using GSM and SMS applications. Several new technologies are currently in competition for the next generation of applications, including wireless LAN, Edge, MMS, and UMTS, which are competing for different applications, and thereby creating new companies or market segments.

> *"Wireless applications are increasingly entering all segments of the market. The mobile sector continues to experience strong growth, likely to be further strengthened by the introduction of third generation Systems. Competition in local access markets will be strengthened by the development of wireless broadband local loop technology. Meanwhile the race to develop new Systems offering global mobility has given new impetus to the growth of the satellite sector, with the development both of narrowband personal communications services and "Internet in the sky" (broadband multimedia communications)". (EU 1999/539)*

The interesting aspect for international strategy is the change in the value chain on several levels. Currently, several companies are attempting to enter the market with wireless LAN services. For example, a notebook with a wireless LAN card can, via a network, be connected to the Internet to download emails, access company applications, or surf the Web. The reach of wireless LAN technology is limited, therefore, the service is applied in specific places, known as hot spots. Typical locations include airports, hotels, cafes, such as Starbucks, and industrial areas. New market opportunities are spread across the value chain. New network equipment is necessary to build a hot spot, new terminal equipment is necessary to access the network, and billing applications need to be developed in order to commercialize the technology. At times, the hot spot provider will enhance the service with specific content to increase the value of the service. Finally, the whole set needs to be packaged.

Based upon the growth rates and value that customers are placing in wireless applications, market entry opportunities or even totally new markets are being created. Wireless LAN technology itself is competing in this context with the next mobile telephony standard, UMTS. The uncertainty from a strategic perspective is based on which technology will dominate and what will be the scale of the resulting business.

3.3.4 Software re-configurable technologies

The development of software re-configurable technologies has significantly reduced the cost of changes and information within networks. A decade ago, network equipment had to be reconfigured with switches within the hardware devices to enable new functionality. Today, network equipment is accessible over the network through either telephone lines or IP networks for the purposes of management and reconfiguration. The trend has been carried further, where currently customer applications are being driven by software that is the customer's communication partner. Internet, speech recognition, and tone dialling, which are general standards in Europe, have increased the interaction capabilities of software to a degree that service applications for information and transactions are automated.

> *Software re-configurable technologies will enable operators and service providers to easily tailor their services to meet the specific local market requirements. Software reconfiguration will provide flexibility and innovation in the fixed as well as mobile networks, by permitting dynamic re-configuration of access points, terminal and network resources. This will have profound implications for manufacturers, operators, (e.g., dynamic allocation of resources, active networks, security, quality of service), service providers (e.g. time-to-market), users (e.g. transparency and portability of Services), as well as regulators and standardisation bodies (e.g. terminal type approval)." (EU 1999/539)*

Software applications are to a great extent based on economies of scale with marginal cost tending towards zero. This characteristic can be used in a company's strategy process to evaluate several options. The incumbent entering other countries can make use of applications already developed, thereby leveraging its home country investment and creating a lower cost position in the country in which it wishes to enter.

3.3.5 Conclusion - Technology

The four technology trends are improvements in or evolutionary steps for existing technologies or processes. It is assumed with a great deal of certainty that the technology trends are taking the stated directions, namely:

- The improvements create new cost positions, providing different market opportunities for new entrants and incumbents.
- The value of the new service will drive customers to switch to new technologies and new suppliers.
- The individual technologies lead to a change within a single activity of the multimedia value chain.
- The combination of several changes creates the value network for customer acceptance of new multimedia services.

Understanding and applying technology is one of the core competencies of a telecom operator. The speed of change in technologies on all levels of the value chain is constantly creating new market opportunities. The individual technology trends are fairly well understood, whereby few technologies compete against the "winning" technology. The underlying uncertainties include the commercialisation of the technologies and the timeframe in which the new technologies will affect the majority of the industry.

Furthermore, the improvements gained by tailoring services to specific markets will have an impact on how telecom operators will internationalise and compete in their local markets. Compared to other trends, technology changes can be seen as evolutionary steps that have a medium impact on the change in industry structure.

3.4 Globalisation[29]

AT&T-Unisource, Global One, and BT Concert were created as alliances by national telecom operators to achieve a strong position as global telecommunication operators. However, none of the alliances could fulfill the vision of their parent company. The cooperation with equal partners at Unisource and Global One did not provide a manageable entity in changing market conditions. Global services could not be provided profitably with the coverage and the pricing that global customers required.

Level3, Global Crossing, and Qwest built global backbone networks to serve wholesale markets and Internet service providers, but never met shareholder expectations. Competition and price erosion were more intense than expected, and consumer demand did not reach the expected short-term volumes.

Equant , Infonet, and Vodafone developed global telecom services. Following several mergers and acquisitions and shareholder restructurings, these companies are still active market players. They have been successful through focused strategies, the necessary financial base, and their ability to react to changing market conditions.

The trend towards globalisation is inherent to our social, economic, and political thinking. In this section I will investigate how globalisation is affecting the telecom arena, and analyse the different approaches taken.

> *"**Globalisation of technologies and markets** is accelerating in scope and intensity, raising technical, commercial, and legal issues which require global solutions. Organisations at intergovernmental and private sector levels have been mobilised into working towards common approaches within a variety of formal and co-operative frameworks."(EU1999/539)*

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[29]For the following sections I define the usage of the terms in relation with international business. The recent popularity and opposition towards "globalisation" positions the term quite differently depending on the context. The economic usage and purpose is not very precise but gives a clear indication of the covered area.(Samuelson 2001).

> *"Globalization is a popular term that is used to denote an increase in economic integration among nations. Increasing integration is seen today in the dramatic growth in the flows of goods, services and capital across national borders."(Samuelson 2001:32)*

I will use the English spelling "globalisation" in all areas besides citations. Original American sources spell sometimes "globalization". In those instances I will use the original spelling.
"International" will refer to anything doing business outside the home country and "multinational" is common used for multinational corporations (MNC) therefore I will not use it for strategy descriptions.
"Multilocal" and "global" will refer to types of worldwide strategy (Yip 1992). The same is valid for a specific type of strategy called "Transnational" as being defined by Bartlett and Ghoshal (Bartlett 1998).

Although the trend towards global telecommunication services has been emerging since decades, there are several unsolved issues related to this trend. Organisations like WTO, OECD, and the World Bank are growing in importance in order to help solve some of the issues. Opposition to globalisation is arising and providing signals that our economic and political systems are far from perfect in handling global demand. Besides the economic aspects of globalisation, an interesting political effect of globalisation is worth mentioning.

The effects of deregulation, namely lower prices, higher competition, and better service quality, were generally seen as benefits. However, the critical aspects of globalisation and resulting uncertainties brought some instabilities to the globalisation process.

> *"Globalization raises many new issues for policymakers. Are the gains from trade worth the domestic costs in terms of social disruption and dislocation? Should countries prevent investors from moving funds in and out so rapidly that domestic markets are threatened? Does integration lead to inequality? Should international institutions become lenders of last resort for countries in financial difficulties? These questions are on the minds of policymakers around the world who are attempting to deal with globalization."* (Samuelson 2001)

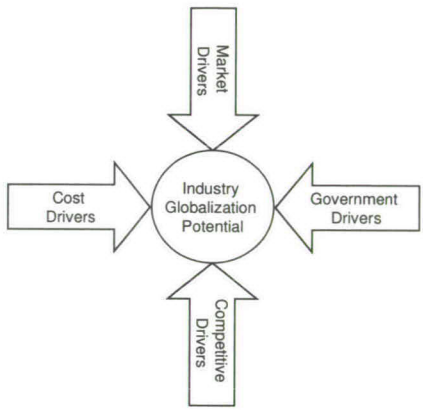
These questions are in line with the currently growing opposition toward global institutions like the WTO, World Bank, and International Monetary Fund. It is outside the scope of this book to deal with these aspects in depth, but provides some evidence that there are several uncertainties involved in the process of globalisation.

3.4.1 Globalisation drivers in the multimedia industry

This section will point to several drivers that provide the reasoning for entering the international multimedia market.

A systematic analysis will apply the concept of "industry globalisation potential", shown in the figure below. The four drivers, namely market, cost, government, and competition, cover the industry conditions that affect the potential for globalisation. (Porter 1986; Yip 1992)

Figure 23: Industry globalization potential



source: Yip (1992)

I will first look at the potential in the industry for each of the drivers from the current telecom perspective, and will point out the potential that drives telecom operators to enter international markets.

In the second stage, I will show how the combination of several drivers eventually creates the potential for different business models. However, I will also describe several industry cases where globalisation attempts failed.

These cases provide the evidence for the potential on one side and the involved risk and uncertainty on the other side.

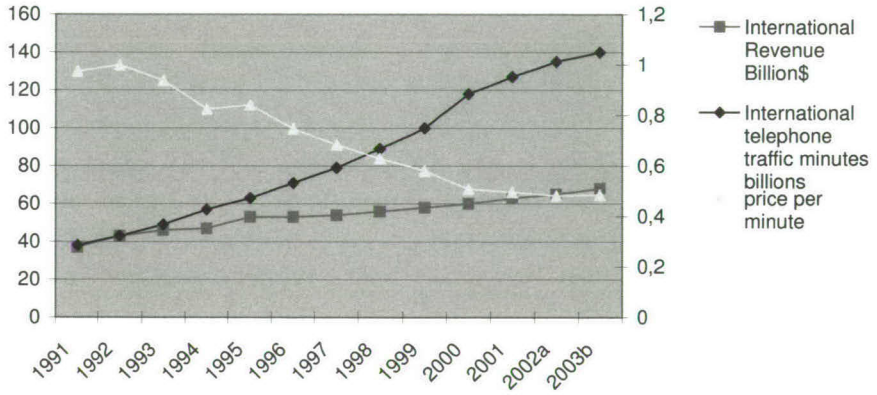
Government Drivers

One of the most important factors for globalisation is the deregulation of formerly protected network-based business discussed in chapter 1 and 2. The signing of the WTO agreement on telecommunication services and deregulation in Europe in 1998 created the environment for global activities.

Market Drivers

The market driver providing the highest potential for international strategy is the growth in consumption of international telecommunication services. The figure below shows global consumption in terms of international telephone traffic minutes. Volume tripled within ten years. The decrease in the price per minute reduced the impact of growth on revenues to "just" almost double in the same period. These numbers do not include the growth in international mobile service that substitutes fixed-net telephone traffic.

Figure 24: Key global telecom indicators for the world telecommunication service sector



Datasource: ITU 2001

The following customer needs are driving the demand in international telecommunication consumption:

- Residential customers travel throughout the world and wish to call home from wherever they are.
- Internet content can be retrieved and fed globally.
- Business customers want to exchange voice and data between their international subsidiaries.

- Supply chain integration with subsidiaries and external partners is taking place on a global scale.
- Sales and buying processes are becoming more global, thereby enforcing competition.
- The buying power of global companies is centralised and they act as one global customer.
- News and information are instantly distributed on a global scale.
- International telecom operators offer complete packages for international corporations that also address the national portion of the communication budget.

All of these activities have led to a steady increase in global communication consumption, thus creating the potential for international expansion.

Competitive Drivers

For national incumbents, this growth was initially less fruitful. In 1997, international telephony revenues, totalling 1.4 billion Swiss francs, accounted for more than 35% of Swisscom's net-traffic with high monopoly margins (Swisscom 1997). For Swisscom, like the other incumbents, the international portion of their revenue is under a great deal of pressure, due to market liberalisation. As a result of deregulation, Swisscom's international outgoing traffic fell 24.3% in one year from 1998 to 1999 (ITU 2001). This decrease occurred despite the growth in consumption.

The international telephony market was one of the most attractive market segments for new entrants. Besides the attractiveness in growth and size of the market, the inefficient interconnection system could easily be circumvented after deregulation[30]. In 1999, the ITU approximated that already 30 % of international traffic was routed on private lines.

> *"A growing share of international traffic, perhaps as high as 30 per cent, now passes outside the traditional accounting rate system with domestic interconnection becoming the dominant mode of operation, notably in Europe. Indeed, there is a thriving market for trading in options to carry traffic on liberalized routes. "(ITU 1999)*

The competitive drivers following deregulation had the same effect for all incumbent telecom operators in Europe. Incumbent telecom operators lost market share in their home country, but at the same time had the opportunity to extend their geographical scope internationally.

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[30] The new entrant could order a high capacity leased line between major cities and compress and multiplex several voice channels over that one line. Those voice channels can be sold individually for a fraction of international interconnection call prices. This model enabled early entrant's first revenues and immediate profits.

Cost Drivers

Cost drivers in the context of industry globalisation potential are often related to economies of scale. After the largest takeover battle in the telecommunications industry, namely Vodafone acquiring Mannesman, an analyst of Credit Suisse First Boston stated in the Wall Street Journal:

> *"It's all about scale, customer services and putting together networks to offer seamless wireless data"* (The Wall Street Journal Europe 2000:4)

Service and customer care processes, backbone infrastructure, and terminal vending carry with them a high potential for economies of scale.

The service and customer care processes shown in the "Telecom Operator Map" can, to a large extent, be designed in a way to automate customer or product handling with IT support. Once the process is in place, scalability is a question of computer power. A self registration process, or usage statistics, can be applied on a global scale, assuming the language translation is implemented properly (c.f.3.3.4).

Once in place, and due to the latest multiplexing technologies, backbone infrastructure can carry gigabytes of voice and data traffic. Currently, there is a clear oversupply of capacity on major communication routes like Zurich-Frankfurt-London-Vienna. Investments for telecommunication networks are high, while marginal costs on the backbones are almost zero (c.f.2.2.1).

Terminal vending is under pressure from shorter lifecycles and increasing complexity. Today's tri-band mobile phones, including a digital camera as an intermediate step towards a "real multimedia terminal", provide an example for part of the problem. Terminal vendors need to leverage their research and development expenditures through a fast global delivery of their products. The economies of scale are essential for survival.

The cost drivers force new entrants, who are faced with high start-up costs, to achieve economies of scale as quickly as possible. Therefore, they try to focus on individual horizontal segments and deploy their competencies internationally rather than implementing the full vertical chain in one country. Examples are the application service provider, internet backbone provider, and internet service provider.

3.4.2 Multimedia industry globalisation attempts

International activities from telecom operators began with a foreseeable horizon towards deregulation. Several different routes were taken to profit from the international business potential and to compensate for the expected loss in the home country. The international aspects in the telecom arena provide an overview of potential international strategies (c.f.1.2.5).
In this section, I will point to four different cases of international business models. I will look at global alliances, focused backbone operators, and the reaction of mobile operators and mobile service providers toward globalisation.

Global alliances

The first attempts toward globalisation in the European telecommunications industry were carried out by the incumbents. Based on a combination of government, market, cost, and competitive drivers, incumbent telecom operators formed telecom alliances.
In 1988, twenty-two European telecom operators formed an alliance to establish a managed data network on a European scale as a response to the competitive efforts by American long distance carriers who offered European telephone services (Bakhshi 1996). However, the alliance failed due to regulatory constraints and to disagreement between the involved parties.

The foreseeable deregulation in 1998 was the next government driver for several different alliance discussions. The German and French monopoly operators created Global One, Swiss Telecom, KPN Netherlands, and Telia of Sweden formed the joint venture Unisource, and British Telecom and MCI-WorldCom formed BT-Concert.

All alliances had the same character. They were formed by national vertically integrated telecom operators (c.f.1.2) who attempted to establish pan-European networks. The incumbents combined their existing networks and extended them where it seemed necessary to provide truly international telecommunication services. Telecom operators wanted to leverage their national experience on an international scale, and expected to lower their cost base for new services by deploying them nationally and internationally.

Through European or global services, incumbents wanted to meet the market demand from global customers who wished to have a communication network from a single supplier.
In addition, incumbents wanted to protect their customer base of multinational corporations against competition by selling their customers national, as well as international, services under one discount umbrella.

The alliances mentioned above failed due to the following factors[31]:

- The management model, with several shareholders competing nationally with international services, was unclear.
- The prices for international services eroded with the emergence of competition.
- The economies of scale could not be achieved due to fast technology changes, for example from X.25 over Frame Relay to ATM or IP.
- Negotiations between the partners about service and technology standards delayed the deployment process.
- Parallel infrastructure due to technology differences, and national versus international competition, increased the cost of new services.

The era of telecommunication services through global alliances came to an end around 1998.

- Unisource Business Networks was split apart and reintegrated into the parent operations at KPN Netherlands, Telia, and Swisscom.
- Global One was integrated into Equant, for which France Telecom owns the majority share.

The examples of telecom alliances provide insights into the risks and problems in a company's international corporate strategy process. The financial performance of the alliances were so disappointing that shareholders reintegrated or sold their shares in the global alliances.

Mobile operator

Providers of mobile telecommunication services were initially nationally oriented. A combination of two government drivers created the potential for international mobile operators in Europe. The emergence of the GSM standard led to cost potential through the deployment of one technology in several countries and the interoperability of one mobile phone in different networks. Together with deregulation of the telecommunications market in Europe, a second operator licence was granted in several European countries. In Germany, Mannesmann had the opportunity to purchase the license and build a network that was known on the market as D2. Today, several mobile licences are being granted in each European country.
Market demand for and the growth rate of national mobile services were phenomenal. The first internationalisation was created by so "called roaming agreements", which is similar to the interconnection system (c.f.2.3.3)[32]. Switzerland,

[31] Based on the Authors experience
[32] The customer travels with his mobile phone to a foreign country and his user information's like phone number and original mobile provider are transferred to the "roaming" partner. Placing a call in the roaming country is billed by the original provider and costs are split, depending on the "roaming agreement".

with a traditionally high demand for international telephony, was active in signing roaming agreements, and developed as assets for additional business models.
Currently, there are a few mobile operators competing for global presence. Well-known international operators include Vodafone, Orange, and T-mobile. Orange and T-mobile have classic telecom operators as majority shareholders (France Telecom and Deutsche Telekom, respectively). Vodafone is a focused mobile operator whose purpose is defined as:

> *Provision of mobile telecommunications services. Supplies customers with mobile voice, paging and mobile data and Internet services. (Vodafone 2003)*

Just a few corporations have had the financial muscle to achieve a strong international presence in the mobile market. Even France Telecom and Deutsche Telekom have struggled with the high debts as a result of building up their international mobile presence. Where France Telecom was subsidised by the French government, Deutsche Telekom had to raise more money through high yield bonds. The mobile operators mentioned so far are vertically integrated, like the "classic telecom" operator. It is uncertain how these operators will react to the convergence of fixed and mobile telephony, and data transfer, with the integrated business model.

Mobile Service Provider

The other international business model for mobile operators is known as the service provider model. In Germany, Mobilcom and Debitel exemplified this model. The focus of a mobile service provider is marketing and sales of mobile communication services without infrastructure ownership. The capacity and network infrastructure are purchased from the infrastructure owners. In Germany, T-mobile, Vodafone, and e-plus are examples of mobile operators that own their infrastructure.

The added value of these service providers are their marketing and sales activities. They have a cost advantage because they do not own any network infrastructure. The mobile service provider develops its processes based on IT in order to leverage the economies of scale and international deployment.

So far, the results in Germany have been mixed. Mobilcom, whose major shareholder is France Telecom, was close to declaring bankruptcy, while Debitel has been able to continue operating under Swisscom's ownership.
This model is seen as a high risk model due to the questionable market potential for focused horizontal activities concentrating on marketing and sales of telecommunication services. In the mobile service provider model, the globalisation driver is primarily cost-driven, where potential economies of scale are enabled through IT based systems.

Focused IP-Backbone Provider

Besides the battle for the end customer, the need for backbone capacity in the long term was foreseeable. Growth of the Internet and IP-related traffic created a large demand for backbone capacity. International networks used to be based on international interconnection agreements. Telecom operators had separate connections based on the interconnection of the "half circuits" of the incumbents connected together (c.f.1.2.5).

Deregulation brought about the emergence of new entrants in the US. Companies like MCI Worldcom, Level 3, Qwest, and others entered the market. They wanted to meet the demand for international leased lines with seamless technologies. IP-backbone providers built their own international networks, and their business model reflected their belief in the future of TCP/IP[33] and related technologies. Through focused operations and the latest technologies, they strove to achieve a better cost position than the incumbent .

The intention of Level 3 was to challenge the "classic telecom operator" through speed and focus.

> *"We are serving customers ahead of schedule over out IP network, using our own electronics and leased capacity. We are also ahead of schedule in the construction of our intercity and local city networks, forming the first international end-to-end IP network."* (Level3 1998)

The advantage is described from a new entrant's perspective of the positioning of the classic telecom operator.

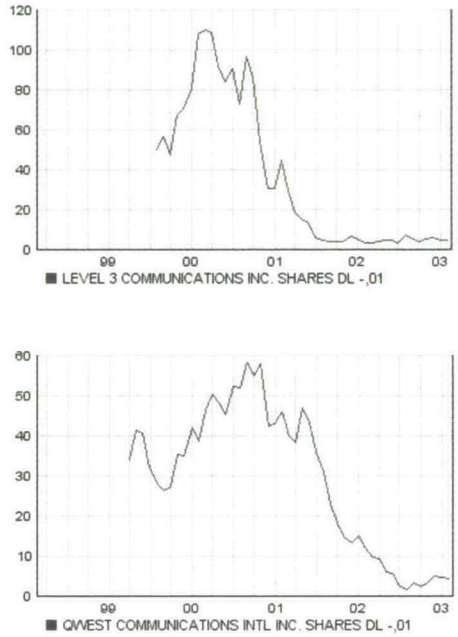
> *The challenge before them is massive. They have enormous investments in older, less efficient legacy technologies that have been in use for close to a century. They have large employee bases that are trained and steeped in older technologies....*
> *In the face of such fundamental technological change and such an economic discontinuity, it is extraordinarily difficult for an established, dominant company to remain dominant.* (Level3 1998)

Financial markets believed in these new business models as well. With revenues totalling three-hundred ninety-two million dollars in 1998, Level 3 was able to grow based upon the capital market funding of six billion dollars. The model was thought to be successful until the end of 2000.

[33] IP / TCP/IP = Transmission Contol Protokoll/ Internet Protokoll = is the base protocol for transporting the content of the Internet and is also believed for substituting classic leased lines and telephony technologies in several instances

Initially, competition was almost non-existent, and the success in raising capital attracted several followers. With the crash of the financial markets, it became obvious that international growth and the need for IP capacity was much less than what was originally thought. Share prices dropped dramatically, and some competitors filed Chapter 11. The charts below show the drop in shares of Level 3 and Qwest during that period.

Figure 25: Stock prices for Level 3 and Qwest



Source: Consors accessed 18.02.2003

The case of the focused IP-backbone providers demonstrates the belief of financial markets in a focused horizontal organization as well as the risks involved in focusing on a network-based business with high investments during fundamental changes in the industry.

3.4.3 Conclusion – Globalisation

The deregulation of telecommunication services launched a movement in the emerging global multimedia business. The combination of market, cost, competitive and government drivers form the rationale for incumbents and new entrants to consider an international strategy. The effect of globalisation upon an incumbent operator, whose original focus was national, is extremely high.

An analysis of the drivers shows that several activities carried out by the incumbent on a national level have a clear potential for global coordination and integration.

The implementation of global business models in the form of alliances, focused horizontal service providers, and global mobile operators, all bear a high level of risk. Several of these models have failed or at a minimum, have never met shareholders expectations.

The situation today is still open and uncertain. The current situation in the financial markets reduces the potential for risky business cases, but the drivers for globalisation still maintain their rationale. Promising business models that are focused on individual activities will tap future potential for opportunities. On the other hand, vertical joint ventures that result in large companies provide some logic in reacting to the demand for (converging) services in a global industry.

3.5 Industry structure

The May 16, 2001 edition of the *Financial Times* contained the two press releases below. On the same day, monopoly operators merged and divested to create what they thought was the best corporate strategy.

> *"Telenor, Norway's incumbent telecoms provider, said it was in talks with SBC Communications over the US operator's 42 per cent stake in TeleDanmark. Telenor and TeleDanmark are in discussions aimed at what would be the first merger between former state-owned telcos."(Financial Times 2001)*

> *"France Telecom and Deutsche Telekom appeared to be on the brink of selling their combined 19.8 per cent stake in Sprint, an expected $3.7bn disposal that ends a troubled seven-year relationship between the three."* (Financial Times 2001)

The discussion of convergence, globalisation, and technology developments have already provided some evidence that industry structure from the telecom operator's perspective will undergo a fundamental change.

From a corporate perspective, this raises the question about how the future industry will be structured. Several industry examples during the emergence of the multimedia industry, as well as the generic change in industry structure, have positioned the trend "change in the industry structure" as one of the key issues in the corporate strategy process.

The Communication Review stated the two developments of "mergers and acquisitions are bringing profound changes in the nature of the industry" and "the Internet overturning traditional markets structure" as drivers for industry change.

Both industry developments influence the telecom arena in different ways but with similar effects. The vertically integrated, nationally oriented value chain of the classic telecom operator is questioned as a long-term sustainable business model. Competition is arising from large new integrated corporations, as well as from focused global new entrants enabled through the Internet.

3.5.1 Mergers and acquisition changing the industry structure

Mergers and acquisitions can currently be observed in several industry areas. The peak of the so-called "mergermania" was reached in 2000, simultaneous to the hype in the stock market. Mergers and acquisitions have changed the scope of companies and their position in the industry.

The Vodafone Mannesmann takeover battle was finalised in 2000 with a 205 bln euro price that Vodafone agreed to pay for Mannesmann in the *"creation of a gigantic wireless player and one of the biggest telecommunication companies in the world."(The Wall Street Journal Europe 2000).* This was the highest price ever paid for a company. And it just happened a month after AOL and Time Warner announced their largest merger ever consummated. Mergers and acquisitions are reshaping in giant steps the multimedia industry.

The Communication Review describes the trends with the following phrases:

> *"**Mergers and acquisitions**, including new alliances, are bringing about profound changes in the nature of die industry and relationships between key players. These changes are creating the firms which will drive implementation of pan-European and global services, built on new and expanded infrastructures." (EU1999/539)*

An analysis of the trends in convergence, technology, and globalisation led to a discussion of the rationale for an incumbent telecom operator to expand its geographical coverage and its position within the multimedia value chain.

Upon defining a new position or evaluating strategic options, mergers and acquisition provide the tools to implement strategy. The number and size of mergers during and following deregulation are strong indicators for their ongoing development.

These changes in scope can be achieved through all three types of mergers, and currently, all three types are being tested in the industry. Weston distinguishes between the three types of mergers, namely *vertical mergers,* which involve firms in different phases of the value chain, *horizontal mergers,* which occur between companies who compete in the same industry, and *conglomerate mergers,* which involve firms from different industries. (Weston 1990)

Whereas the horizontal merger supports arguments for globalisation, conglomerate mergers support the trend towards convergence.

3.5.2 The Internet changing the industry structure

The second force that is directly changing industry structure is the development of the Internet. The Internet emerged from the ARPA University network. The interesting fact is that the system is highly decentralised, and in its structure is independent from national borders and authorities. The content fed into the Internet is globally available and, aside from private billing methods, free of charge.

There are activities related to the Internet, namely access, content, applications, and services. Each of these activities can be used to create a business on its own or as a differentiator to generate revenues. Companies like AOL have positioned themselves as global suppliers with a complete service package that includes email, chat, messaging, and content.

Yahoo and eBay are also global and Internet-based. One of the important aspects in this section is that a business model related to the Internet has a global reach from the beginning. This does not mean that it will function on a global base, when one considers languages, currencies, and delivery problems. The vertically integrated value chain, which was formerly necessary, does not exist in this business model. As a result, a focus on horizontal elements can take place.

Internet technologies and the wide acceptance of the Internet are enabling network economies, and are changing the rules of the industry arena and enforcing the information society.(Shapiro/Varian 1999; Hagel/Singer 1999; Tapscott 2000; Evans/Wurster 2000)

> *"**The Internet** is to a large extent overturning traditional market structures, by providing a common platform for the delivery of a wide range of services. The Internet blurs the distinction between voice and data transmission services, revolutionizes traditional pricing models for communications services, and challenges existing regulatory structures. In Europe the Internet has been experiencing a continued expansion, in terms of the number of users and the volume of traffic. This growth will be fuelled by implementation of the next generation of Internet protocols that will facilitate the delivery of voice, data and video over the Internet with agreed levels of quality of service." (EU1999/539)*

The winners of these changes are the companies that are focusing on their role in the industry network. Two types of companies can profit from the emergence of the Internet:

- First, the companies that provide technologies for the Internet can continue to profit from the tremendous growth that took place between 1995 and 2000.
- Secondly, those companies will benefit who understand the new economies and focus on specific value activities within the industry networks. The ability to position activities of the information industry into the network and communicate to a broad base at much lower rates than before drives down transaction costs, and therefore improves the economic benefit of networked companies.

The model of the networked companies emerged and is seen as one of the winning strategies for the twenty-first century. Names like Cisco, Dell, and eBay are examples of companies that are profiting from both aspects. Dell provides computer technologies for the Internet, and learned early on to position itself through a clear direct sales Internet channel.

The benefits are built on standards, wide acceptance, and instant communication processes. McKinsey conducted a major study on the future of the network company, which concluded that the following characteristics are present in every functioning network and seen as the key success factor in the industry arena:

- *Uniform standards governing the exchange of information*
- *Rigorous performance standards maintained mostly through customer evaluations and partner incentives built into the network*
- *The sharing of benefits generated by the network with all partners*
- *An on-line presence for all key business processes*
- *The development and dynamic testing of new opportunities with network partners (Häcki 2001)*

The Internet, as a major trend changing the industry structure from a vertically integrated towards a network structure, is discussed and widely accepted in the literature and through industry evidence.

3.5.3 Future industry structure

I have highlighted two trends affecting industry structure. These two trends are competing and complementary in the sense that through mergers and acquisitions, companies integrate both vertically and horizontally, while the Internet is supporting networked industries, thereby changing the industry structure towards disintegration. Both trends are supported by industry evidence and examples of successful implementation by individual companies.

The question about what this means for the future industry structure is one of the important topics for future research projects conducted from leading think tanks like MIT and the Gottlieb Duttweiler Institute. The Sloan School of Management at MIT inaugurated an ongoing research initiative called "Inventing the Organizations of the 21 st Century" (Sloan 1997).

Similar work was done in 1998 by the Gottlieb Duttweiler Institute für Trends und Zukunftgestaltung. '(short GDI) in "GDI_Szenarien 2010 (GDI 1998). These research institutes could not find a single definition for the future industry and the observed uncertainties. As a result, both research institutes applied the scenario planning technique as the underlying research tool for describing possible future stages of the industry.

The Sloan School of Management came up with two scenarios called "*Shifting Networks of Small Firms*" and "*Virtual Countries*". These scenarios focus on organisational structure and the community environment necessary to support organisational structure.

GDI called their scenarios *"Shaky Brave New World"* and "*Ein abendländischer Traum*". GDI focuses more heavily on the development of the community and social side, while they also see organisational structure as the underlying source for community development. However, both research institutes agree on two similar organisational scenarios, namely:

1. The large vertically and horizontally integrated organisation that developed from ongoing merger and acquisition activities.
2. The small network-based decentralised organisation that utilises increasing communication and trading possibilities with massive reduced transaction cost.

The following boxes provide the essentials of the two scenarios from the Sloan Scenario planning process. This work will provide the basis for the argumentation in the usage of the future structure in the multimedia industry.

3.5.3.1 Scenario one: Small companies, large networks

Imagine that it is now the year 2015....

The corporation of the late twentieth century was just a transitional form. It lasted more than one hundred years, but few corporations of that kind remain today. Now, looking back at the "dinosaur" era in which General Motors, Microsoft, and Sony stalked the earth, we are most aware of the tiny "mammals"-entertainment production companies, construction project teams, and consultant work-groups-which operated without much public notice back in the 1990s, only to become the prototypes of today's modern organization.

Today, nearly every task is performed by autonomous teams of one to ten people, set up as independent contractors or small firms, linked by networks, coming together in temporary combinations for various projects, and dissolving once the work is done. When a project needs to be undertaken, requests for proposal are issued or jobs to be done are advertised, candidate firms respond, sub-contractors are selected, and workers are hired largely on an ad-hoc basis. ...

Even though this way of organizing work is extremely well-suited to rapid innovation and dynamically changing markets, the world would be a lonely and unsatisfying place if all our interactions were contractual. Therefore, we are all fortunate to have independent organizations for social networking, learning, reputation-building, and income smoothing. These communities evolved from professional societies, college alumni associations, unions, fraternities, clubs, neighbourhoods, families, and churches. Many are similar to the writers' and actors' guilds of Hollywood. They help us save for retirement, and most of us pay a percentage of our income to our "guilds" as a voluntary form of unemployment insurance. It is here that we learn and update the skills of our professions, and share war stories and reputations. Perhaps most importantly, we derive much of our sense of identity and belonging from these stable communities that we call "home" as temporary projects come and go.

There are two key elements of this scenario: the fluid networks for organizing tasks and the more stable communities to which people belong as they move from project to project. ...

The second major element of the Small Companies/Large Networks scenario is that existing or new organizations will step in to meet the "life maintenance" requirements-the need for health insurance, protection against unemployment and income fluctuation, professional development, and a sense of belonging and community-of those who work in networked organizations. ...

3.5.3.2 Scenario two: Virtual countries, mega play

The second MIT scenario posits a world economy dominated by large conglomerates which operate globally across a number of industries. As with the present-day Asian keiretsu arrangement, there will be a small number of core firms-large holding companies which sell products with widely recognized brand names-occupying a position at the center of the economy. These companies in turn will have a series of permanent or semi-permanent relationships with various smaller supplier firms, which will stand at the periphery of the system. The industry structure in most sectors will be oligopolistic, with a small number of major competitors holding dominant positions, and high entry barriers preventing upstarts from challenging the hegemony of market leaders.

The huge conglomerates envisioned in the Virtual Countries scenario could grow out of a continuation of the merger wave which has swept through the global business environment in the mid-1990s. The value of announced mergers involving U.S. firms totaled $519 billion in 1995 and $659 billion in 1996, by far surpassing the $353 billion registered in 1988, the previous peak year. [19]Recent mergers have been concentrated in industries affected by government deregulation-telecommunications, broadcasting, financial services, aviation, natural gas and electric utilities-or where public policy has directly or indirectly encouraged consolidation, as in the case of the aerospace and health care sectors. But the globalization of markets has also driven some mergers-British Telecom's acquisition of MCI is one example-and led to the creation of numerous international joint ventures, such as American Airlines' proposed agreement with British Airways.

Management theory of the last decade has emphasized the importance of firms staying tightly focused and relying on their "core competencies." This trend was largely a response to the conglomerate craze of the 1960s and 1970s, when many large firms diversified into areas entirely unrelated to their original businesses. In the sectors with the greatest volume of recent mergers, the activity has primarily involved the buying of competitors or diversification into closely related areas. The result has been rapid consolidation in a number of industries, often on a global scale. When a firm sells off a business unit unconnected to its central activities and buys an entity with a position in its core industry, the company is effectively substituting scope for scale.

One interpretation of the widespread substitution of scope for scale is that firms are responding to the increased competitive pressures created by the arrival of truly global markets-by this argument companies are refocusing because their competitors will hurt them if they don't. Some observers believe that once the consolidation of major industries on a world-wide basis has run its course, and an oligopolistic industry structure returns, unrelated diversification may once again appear attractive, and a series of mergers could ensue to create a second generation of conglomerates, this time on a

global scale. Such a sequence of events could serve as the means of forming the world-spanning conglomerates of the Virtual Countries scenario.

Another critical factor which could drive the world toward a Virtual Countries future would be the legal system's inability or unwillingness to protect intellectual property. Should intellectual property laws be weak or confusing, or enforcement of them lax or ineffective, a greater degree of vertical integration may become a strategic imperative for firms whose products have significant knowledge content. Such an approach could become necessary because, in the absence of legal safeguards, capturing the value inherent in a piece of knowledge would require producing and selling a tangible product which physically embodied that knowledge. Under such circumstances, larger companies would be at an advantage, and there would be strong incentives to prevent important knowledge from passing outside the boundaries of the firm.

I skip here on the three other elements of the virtual countries, which are the role of firms in employee's lives, employee ownership of the firms, and employee selection of the firm's management. These points are important for the full scenario definition, but do not provide further input to the structure of the future multimedia industry.

3.5.4 Conclusion – Industry structure

The two trends "mergers and acquisitions" and "the Internet" are major forces driving the change in industry structure. The high degree of uncertainty regarding the model that will dominate the future of the industry has led to the development of different industry scenarios by leading think tanks.
The scenarios will be integrated to support the discussion of the trends in the emerging multimedia industry. The application of the two trends, which are summarised under the term "industry structure", to the scenarios, the following hypothesis can be stated:

- Due to the high degree of merger and acquisition activities in the multimedia industry, companies can **grow highly integrated and global**. For example, the merger of Vodafone and Mannesmann created the fourth largest corporation worldwide in terms of market capitalisation.

- The emergence of the Internet and the resulting new industries **break the current vertically integrated value chains,** and creates new, smaller companies. ISP's, ASP's, web development companies, and infrastructure owners will create parts of the emerging networks.

3.6 Conclusion – Trends in the telecom arena

The analysis of industry trends has shown that the classic telecom operator is faced with several changes. The telecom industry is not expected to exist in its current form in the future, but rather, telecom operators are assumed to be part of the emerging multimedia industry. Current activities will be integrated as part of the multimedia value chain.

The classic telecom operator was vertically integrated, from customer sales and service point to the physical cable in the ground. The organisation was nationally oriented with interconnection agreements to provide international solutions. Deregulation of the telecom industry initiated a massive change in the industry.

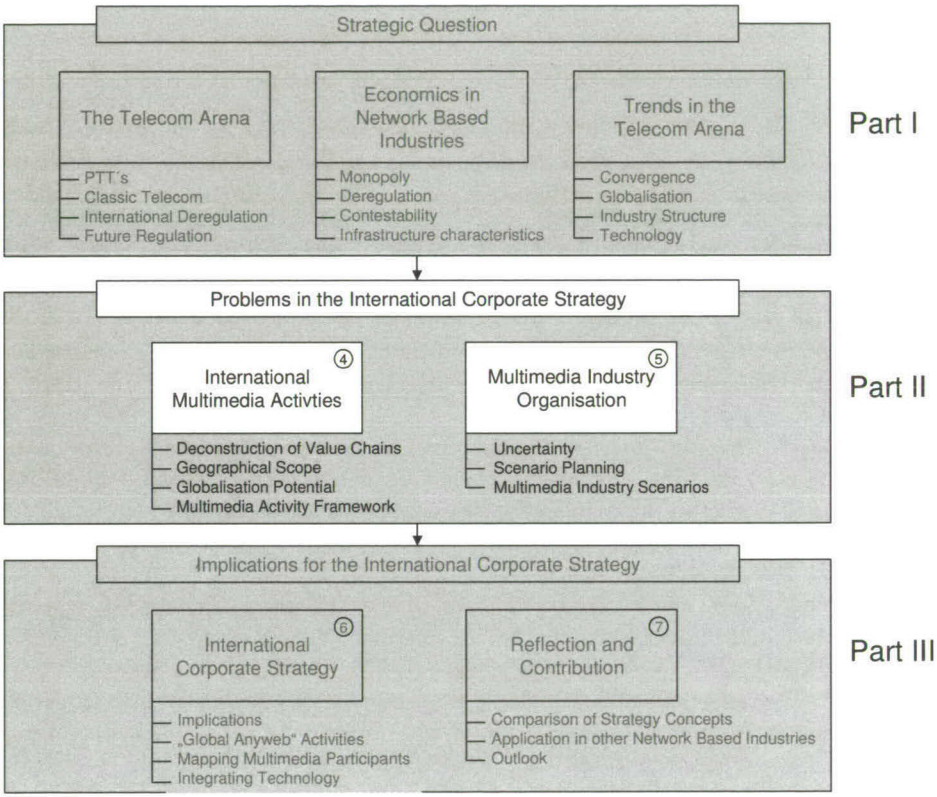
Several significant trends are reshaping the industry arena:

- Convergence of telecommunications, IT, broadcasting and media industries is expected to change within each of the value chain activities, but to a different extent. Eventually, we will have a new industry represented by the multimedia value chain, and telecom operators will be one of many players in the multimedia industry.
- Technology and processes will develop further to be able to provide complete digital, customised services to the end user. Mobile technologies and the Internet will have significant market share in the multimedia industry. Technology life cycles will shorten, resulting in more financial pressure, especially on former monopoly operators.
- Globalisation has different drivers and a high industry potential on the individual levels of the value chain. Globalisation attempts have shown the risk and uncertainties in utilizing the potential.
- The industry structure will definitively change; however, it is uncertain if large companies or the networks of small companies will dominate the competitive landscape.

Each of these trends has been discussed individually. However, the trends are affecting the industry simultaneously and influencing each other. It is unclear which elements are the cause and which ones the effect.

Uncertain is the development of the industry. What business model will dominate the individual activities and who will dominate the customer and what portion of the value chain will be produced by this kind of sales channel.

Part II: Multimedia Industry Framework



Introduction: Problems in the International Corporate Strategy Process

The evolution of the telecom arena is fundamentally reshaping the industry, which brings about several opportunities and uncertainties about the future industry. In defining the international corporation, it is necessary to address these opportunities and uncertainties by answering the following strategic questions (c.f. introduction):

- What international business will the corporation be in?
- How is the corporation structured to manage this business?
- How does the corporation get there?

In this section, I will focus on the main problems resulting from the industry analysis in Part I, before proceeding with the development and discussion of a framework to overcome these problems.

Deregulation initiated changes in the telecom industry. Furthermore, the multimedia industry is emerging out of the convergence of the telecommunications, media, information technology, and the broadcasting industries. The new industry will be global and to a high degree based on new technologies, and will have an enormous impact upon the international strategy of participating companies.

The changes in the telecom arena are occurring in several dimensions simultaneously. Political, economical, technological and organisational aspects are reshaping the structure of the industry, for example:

The Telecom Arena
Deregulation of European telecom industries in 1998 created a new international perspective for former national telecom operators (EU, WTO, OECD, ITU).
The liberalisation of telecom markets was formalised during the last decade of the 20th century. Telecom operators, who were formerly monopoly operators, are losing part of their 100% market share in their nationally protected market. At the same time, opportunities for operators to extend their geographical and product portfolio scope are emerging. The industry is undergoing significant changes that are being influenced by several trends and that have a high impact upon industry structure.

Economics in Telecommunications Regulation
The telecom industry was protected for decades under the terminology of the natural monopoly. Through the recent trend towards deregulation, the perspective upon the telecom operator's value chain has changed. Today, contestability theory is used to differentiate between the individual activities.

The market is liberalised for contestable activities, whereas for non-contestable markets, new regulations are being introduced.
In the infrastructure-based telecommunications business, interconnection and universal service obligations are the critical issues for the regulator, incumbents, and new entrants shaping the market place. (Pigou 1951, Stigler 1982, Kahn 1998, Coase 1990, Samuelson 2001, Bailey 1997, Laffont/Tirole 2000, Shy 2001). Telecommunication networks are based on specific underlying economics discussed as "network externalities" and "switching cost" (Shapiro/Varian 1999, Shy 2001, BERGMAN et al. 1998).

Industry Trends
Convergence is evident on all levels of the value chain, in addition to creating the multimedia industry. However, the discussion led by the regulator neglects the details on the activity level and the international aspect of convergence.
Globalisation is taking place in the telecom industry, but so far, several business models have failed. It is uncertain if horizontal, vertical, or focused business models will generate future shareholder returns (Yip 1992 ,Bartlett,Ghoshal 1998, EU 1999/539, Porter 1986).

Mergers, acquisitions, and the Internet are changing **industry structure**. It is uncertain which type of organisation will survive the changes in industry structure (Weston et.al.1990, Häcki, Lighton 2001). Research on future developments suggests two alternative scenarios, namely "small companies, large networks" or "virtual countries mega play" (Sloan School of Management 1997, GDI 1998).

New technologies for wireless application, process handling, and digital TV are driving change in the creation of new markets that are substituting elements of the existing value chain.

The combination of all of the above factors initiated the changes, opportunities, and uncertainties in the industry structure. In turn, telecom operators need to change their market focus in order to generate an appropriate return to their shareholders. The industry analysis has so far identified two major problems:

1. Globalisation Potential in Multimedia Activities -The analysis of the trends has shown that globalisation potential is high but differs significantly on the horizontal levels of the value chain. Industry experience has so far been based on the current vertical value chains, and not the future multimedia activities. Telecoms were historically nationally oriented; however, customer needs for multimedia services are global. The industry change will be reflected in a new international value chain. I argue that international strategy formulation for the emerging multimedia industry cannot be conducted on the existing activity level. Instead, it has

to be conducted on an activity level for the future industry. However, existing strategy concepts (Porter 1985, Brandenburger 1997) can be extended to serve in a future environment. The globalisation potential of future activities will influence the industry setup (Bartlett 1998, Coyne 1998, Hamel 1994, Yip 1992).

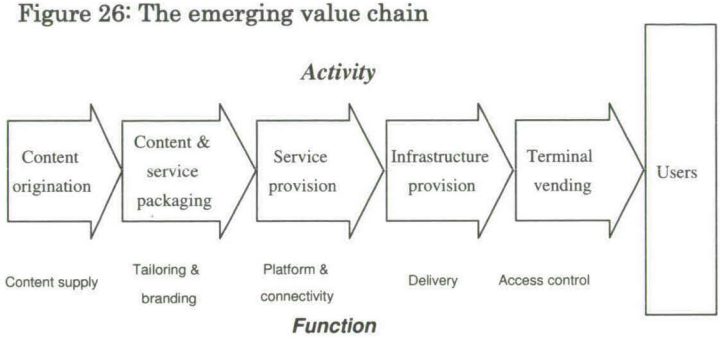
2. Uncertainty in Industry Organisation - The methodology for answering the strategic question needs to address the level of uncertainties and the high impact of change in industry structure. Economic studies have addressed the problem of "uncertainty" systematically (Knight 1921,Kahnenman 1997, Courtney 1997). In relation to the level of uncertainty, different strategic methodologies can be applied. My assumption is that for a given level of uncertainty, several structured approaches are possible. "Scenario planning", as one of the methodologies, will provide superior and substantial insights with which to analyse the future industry organisation. (Wack 1984, Schwartz 1996, Fahey 1998, Ringland 1998, Heijden 1997, Geus 1997).

The following two chapters will present a framework as a conceptual basis and will deal with the problems in the international corporate strategy process.

4 International Multimedia Activities

In this chapter, I will focus more strongly on the strategic question by describing the primary activities in the multimedia industry and the potential for internationalisation. Having analysed the trends in the industry, I argue that the discussion of the telecom operator strategy can be led using the "emerging value chain" as a guideline. The multimedia value chain introduced in section 3.2 provides an overview of the industry activities, the boundaries, and players in the emerging multimedia industry. Below is the figure as a basis for discussion in this chapter:

Figure 26: The emerging value chain



Source: Squires Sanders Dempsey,Analysis 1998

The industry analysis of the multibillion multimedia industry and the diverse set of technologies, markets, and activities requires a structured approach.

The value chain, with its underlying activities, is one of the classic tools used to conduct an industry analysis (Porter 1980). I will base this chapter on the Porter concept with one major difference. Michael Porter conducts the industry analysis on the *current* industry with existing activities. After discussing the trends in Chapter 3, I argue that the telecom industry will not continue to exist in its classical form, therefore, I need to conduct the value chain analysis on *future multimedia activities* rather than on the existing telecom value chain.

The multimedia value chain is a good starting point for the strategy discussion. However, I see some limitations in the model for the corporate strategy process. To reduce the limitations, I will develop a more detailed framework in this chapter:

The multimedia value chain was created to illustrate the convergence on an activity level. This activity level represents a combination of core competencies from several large industries. It is assumed that the technologies are evolving with the possibility

to handle all converged multimedia information. From a technical aspect, this approach is correct. The amount and diversity of underlying technologies, infrastructure types, services, and types of content will grow with convergence . For the corporate strategy process, I argue that it is necessary to look at the activities of the multimedia industry on a detailed level by dividing the multimedia value chain into several activities on the horizontal level.

The value chain approach assumes the integration of value-adding activities within one firm. The size and scope of integration in a company is determined by the industrial organisation. Porter defines the terminology "value system" for a value chain spanning over several companies[34]. I argue that the future multimedia industry should be viewed as a complex system of interlinked activities resulting from the deconstruction of vertically integrated value chains.

I did not take any international aspects into consideration in the convergence discussion. Analysing the trend "globalisation", I have shown that the globalisation drivers of the horizontal levels are quite different. To determine the impact and diversity on the activity level, the industry analysis must evaluate the underlying dynamics and potential.

Therefore, I need to develop a more detailed model to overcome the limitations of the multimedia value chain in the corporate strategy process. This approach is in line with the proposal from Michael Porter "to go from a general industry view further into analysing the activity system of a company" (Porter 1996).

This chapter is structured to develop the multimedia activity framework.

- First, I will discuss the deconstruction of the value chain.
- Secondly, I will look at the activities in more detail and on the corporate strategy level.
- Thirdly, the detailed view of the activities will serve as the basis for the analysis of international potential.
- Lastly, I will extend the value chain towards the "global multimedia activity framework."

This framework will serve in further strategy work to evaluate corporate positions for the emerging multimedia market. The core competencies and firm resources can be discussed on the specific activity level and the trends of globalisation, convergence, and horizontal market developments can be analysed.

[34] See Appendix – Value Definitions

4.1 Deconstruction of the "value chain"

Although the concept of the "multimedia value chain" was just introduced in chapter 3 as the convergence of several integrated value chains, I am already faced with the need to argue the deconstruction of the "chain" in this chapter.

The terms value chain, value activities, and value systems were introduced by Michael Porter to discuss the competitive advantage of a firm[35]. He provides a statement which will support the further discussion:

> *"Every firm is a collection of activities that are performed to design, produce, market, deliver, and support its product. All these activities can be represented using a value chain."* (Porter 1985)

From the telecom operator's perspective, service delivery to the end-customer was historically an integrated value chain. However, the industry analysis in Part I provided the basis that this value chain will eventually be replaced by the multimedia value chain. Several arguments were presented that a telecom operator's traditional value chain will change:

- The signing of the WTO agreement to liberalise telecommunication services by 72 member states ensures that the telecommunications market will be international.
- Interconnection regulation will reduce barriers to entry for competition.
- Convergence is introducing competition on the horizontal levels.
- New technologies will lead to changes in individual activities.
- Globalisation has different drivers on each horizontal level of the value chain.

From a regulatory perspective, the multimedia value chain is handled as one integrated industry, where regulatory authorities are not concerned about the degree of vertical integration within the industry. The major regulatory issue is the introduction of competition on the horizontal levels of the value chain.

However, from a corporate perspective, what is important, and currently highly uncertain, is how the industry will organise and how the value chain of an individual company will eventually be positioned.

Industrial organisation is a broad field in economic research. Part of the discussion is based on Coase´s publication "The nature of the firm" (Coase 1990). In his publication "Industrial Organization", Coase defines the organisation of an industry as:

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[35] see Appendix – Value definitions

"the way in which the activities undertaken within the economic system are divided up among firms."(Coase 1990:58)

The reasoning behind dividing the different activities is given by the theories of transaction costs (Coase 1990,).

The way in which an industry is organized is thus dependent on the relation between the costs of carrying out transactions on the market and the costs of organizing the same operations within that firm which can perform this task at the lowest cost.(Coase 1990:63)

The factors that induce a shift of transactions from what Coase calls market to internal organisations are also considered by Oliver E.Williamson (Williamson 1973). These factors play an important role in the organisation of the future multimedia industry.
Williamson differentiates between human and transactional factors. Transactional factors include uncertainty, small numbers, and the impact of information .
With the emergence of the "information society", the costs for addressing transactional factors can be reduced, which change the parameters for the industry organisation.

The theories of transaction costs and the change in parameters through Information technology led to new discussions about the role of the firm and the integration or disaggregation within an industry. (Tapscott 1996, Downes 1998, Malone 1998).
The deconstruction of value chains is discussed under the terminology "disaggregation" and reaggregation of the firm. Philip B. Evans and Thomas S.Wurster investigated the changes in the value chain for retail banking, and describe a pattern which is a typical trend in the industry changing towards the information society.

"The integrated value chain of retail banking will have been deconstructed. Deconstructed, but not destroyed. All old functions will still be performed, as well as some new ones." (Evans/Wurster 1997)

These findings are supported by several other authors (Cronin 2000, Hagel/Singer 1999). Hagel and Singer see three kinds of businesses for most companies, namely a customer relationship business, a product innovation business, and an infrastructure business. The multimedia value chain goes a step further by differentiating between several types of businesses in the product innovation and infrastructure area – infrastructure provisioning, terminal vending, content origination, and packaging.

Hagel and Singer concentrate on individual activities as the important issue to optimise a firm's performance. They propose the deconstruction under the terminology of "unbundling":

> *"But these core processes represent very different kinds of businesses, each with unique economic and organizational characteristics. Bundling them together into a single corporation inevitably forces management to suboptimize the performance of each business in ways that no amount of core process design can overcome".* (Hagel/Singer 1999)

Evans and Wurster also recommend looking at individual activities to determine strategic positions. They assume that existing value chains will be fragmented into multiple businesses due to the reduced transaction costs in the information society. However, they do not mention the possible reintegration into a new value chain.

> *"No single set of predictions can be applied across the board, but some fundamental strategic implications of the changing economics of information can be drawn. Existing value chains will fragment into multiple businesses, each of which will have its own sources of competitive advantage" (Evans/Wurster 1997)*

It is unclear which activities will belong to the corporation in shaping its strategy in the future multimedia industry. The industry scenarios "virtual country", as well as the "large networks of small companies", will have a network of activities interlinked to meet customer needs. However, it is uncertain how many of these functions will be integrated in one firm, and how many will be divided between different firms that create a network.

The view of the multimedia industry as a collection of activities enables me to conduct the industry analysis independent of how the industry will eventually be organised.

The activity level will serve as an important level for the strategic analysis under the uncertainties in the emerging multimedia industry.

4.2 Corporate activity level

A single activity in the global multimedia value chain already represents a multibillion € business. There are several multimedia industry examples for which industries have developed out of single activities over the last decade.

For the infrastructure provisioning activity, Vodafone may dominate the European mobile market. However, I doubt that the company will have a strong foothold in the fixed network market. Both activities fall under the same activity in the multimedia value chain.

Another example is Cisco, who is a terminal vendor that provides IP telephones and backbone infrastructure. Cisco does not compete against Sony in the play-station market, although the core competencies of both companies fit best under the terminal vending activity, where convergence has already taken place to some degree.

I argue that the concept of the converged multimedia value chain is appropriate for discussions in an early regulatory stage. It also assists in acquiring a long-term perspective on the major trends in the industry. However, it is not the appropriate level of depth for the corporate strategy process. I see empirical reasoning, as well as a regulative perspective, as necessary to investigate the activities on an appropriate "corporate" level. The argument for differentiating the activities on the horizontal level can best be discussed by providing some industry examples.

4.2.1 Empirical reasoning

The infrastructure provisioning activity provides a good case study for investigating the details within the individual activities.

Infrastructure for telecommunication services includes fixed telephony networks, mobile telephony networks, and data infrastructure. In addition to the physical cables, there are the complex switching technologies that direct calls and data to their required destination. In 1996, Swiss PTT, a classic telecom operator, had over 34.5 million kilometres of telephone lines in Switzerland (Swiss PTT 1996). Besides these fixed cables, Swisscom owns the mobile network, satellite dishes, and the switching and operating units. The high investments in this infrastructure were the argumentation for the "natural monopoly" (c.f.2.2.1).

Under the trend globalisation, it could be assumed that this infrastructure will be deployed with other types of infrastructure, like TV and radio, on a global scale, based upon the trend towards convergence. Although it is hard to imagine that a corporation like Swisscom will target its corporate strategy to develop this global

converged infrastructure. However, it is useful to think about this extensive infrastructure as a virtual corporation in which the individual activities are analysed in detail, as well as how these activities fit into the big picture and where successful strategic positions could be achieved.

Regarding infrastructure provisioning, this would mean that Swisscom will consider international positions, technology changes, and convergence in the fixed telephony, mobile telephony and data communication as individual businesses, rather than as one activity called "infrastructure provisioning".

4.2.2 Regulatory perspective

The aspect of introducing a corporate activity level below the multimedia value chain is also supported by changes in public policy.A look at the regulation of telecommunications within the EU shows that convergence was introduced with the Green Paper of convergence, which was designed to establish a long-term regulatory framework. However, actions regarding deregulation and a change towards the new framework are taken with small steps in the regulation of individual activities within the framework. The topics of infrastructure characteristics, interconnection, and universal services are discussed in chapter 2. They provide the basis for understanding that competition entering the field will focus on individual activities, and will interconnect with the incumbent to reduce the barriers to entry.

On the one hand, regulatory bodies monitor the markets that apply contestability theory to analyse the value chain and where regulatory actions are needed to enforce competition. On the other hand, regulatory bodies do not intervene in areas in which barriers to entry are low.

In the infrastructure provisioning activity, a wide spectrum of infrastructure with different characteristics is under regulatory observation. The top hierarchy of "Monitoring European Telecom Operators" (EU 2002 IDC) differentiates between the traditional infrastructure provisioning categories (activities) fixed telephony, mobile, internet, broadband, and cable TV. Regulatory actions are currently being undertaken for specific sub-categories within these five categories. Regulatory topics discussed in the public press the last couple of years, for example "interconnection" "UMTS licencing", and "unbundling the local loop", already belonged to the activity "infrastructure provisioning".

To discuss the regulatory impact on a corporate level, there is the same need as on an empirical level to differentiate between and within the activities. However, activities must be chosen with a view toward the future under the effect of the convergence.

4.2.3 Graphical presentation of the corporate multimedia activities

So far, I have discussed convergence on a high level. However, corporate strategy and public policy changes are taking place on a lower activity level, which I call the corporate activity level. The theoretical discussion about these numbers of activities can be facilitated through a graphical representation. To illustrate the arguments I conducted a two step approach:

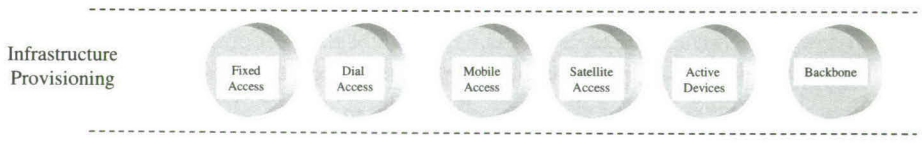
First, I defined some of the important future activities for each horizontal layer of the multimedia value chain. The selected activities are far from complete, but they represent important factors in discussing corporate strategy.

Secondly, I mapped the activities within the horizontal layers of the multimedia value chain. This kind of mapping is similar to the approach of the Network Management Forum introduced under the value chain of the classic telecom operator (c.f.1.2.4) (NMF 1998). Due to its role, the NMF focused on the operational aspects of a classic telecom operator. My mapping is designed for the strategic corporate level of the multimedia industry.

In the graphic below, I show the corporate activity layer for the multimedia activity "infrastructure provisioning", which also served for the theoretical discussion.

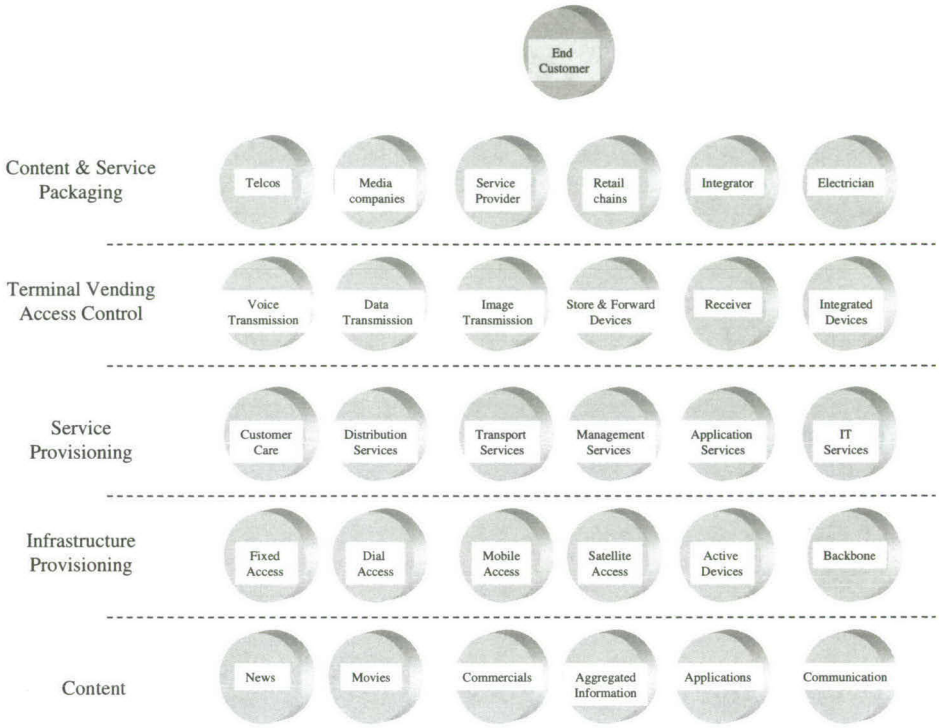
Each category within the "infrastructure provisioning" activity is designated with a bubble. I differentiated between different types of access, backbone, and active devices. These categories have different regulations, economics, technology life cycles, and globalisation potentials, and represent the majority of the infrastructure in the multimedia industry.

Figure 27: Corporate activity layer – Infrastructure provisioning



In Figure 28 on the next page, I have developed a corporate activity layer for each of the five activities of the multimedia value chain. The dotted line represents the aspect of transaction cost in the value chain. This transaction can take place within or between corporations.

Figure 28: The multimedia activities



The activities listed serve as an example for the differentiation. On the horizontal layer, there is no specific number of activities. However, the chosen activities seem plausible for the discussion of corporate strategy, as they cover the majority of the value chain and reflect the future aspect of convergence and new technologies.

In the next sections I will extend the model with the international aspects of the multimedia activity framework.

4.3 Geographical scope of the multimedia activities

This section deals with the vertically integrated telecom operator's effort to extend his geographical scope in the emerging multimedia industry. The drivers for globalisation were introduced in the discussion of the industry trend "globalisation", during which the problems of globalisation and the various failed attempts to globalise were referenced (c.f.3.4.2). The discussion of the trends provided evidence that the emerging multimedia industry will create some international business opportunities (c.f.3.4.3). However, it seems almost impossible to duplicate the incumbent's infrastructure on a global basis and achieve the market share necessary to leverage high investments. Some of the multimedia activities have enormous globalisation potential, while others are restricted to a small local environment.

The model of the multimedia industry on the corporate activity level provides the basis for discussing globalisation potential. In this section, I will discuss the specifics of international potential and the dynamics of the multimedia activity level. After introducing the conceptual base and the theory of "the dynamics of network based business", I will map the findings into what I call the activity framework of the multimedia industry.

4.3.1 Globalisation potential

The discussion about the deconstruction of the value chain and the "corporate activity level" leads to the conclusion that it is not appropriate to take a global view of the vertically integrated value chain. An analysis of the globalisation drivers for the telecom industry has already provided the evidence for the potential and need for globalisation. However, discussions have also shown that the mixture of packaging, terminal vending, service, content, and network infrastructure characterising the industry activities are quite diverse in the dynamics and potential on a horizontal level.

The applied concept from George S. Yip is designed to analyse industry globalisation potential. It also delivers the rationale on the corporate activity level. Conducting the analysis for the thirty multimedia activities in the model would deliver the necessary information for the corporate strategy process. However, thirty descriptions without graphical representation would not provide an adequate overview of the complete picture.

A more elegant tool that provides an overview, as well as the details, was designed by Bartlett and Ghoshal (Bartlett*/Ghoshal 1998).* Bartlett and Ghoshal developed the concept of "the anatomy of a transnational" to determine the different potentials within a value chain.

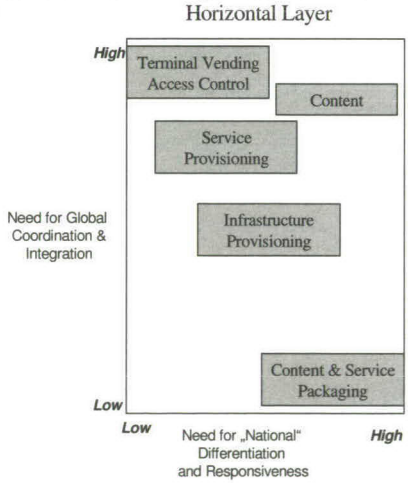
"Examine the concept of anatomy as it relates to the structural characteristics of the transnational company." (Bartlett/Ghoshal 1998:321)

To analyse the anatomy of a transnational company, Bartlett and Ghoshal developed a matrix which differentiates between national and global needs. The integration of the aspect of national potential is another advantage of the Bartlett and Ghoshal concept over the "Yip" model. From the analysis on the industry level, the graphical representation is designed to "zoom" in on several steps, all the way to the functional level. I will apply this matrix for the multimedia industry at both the industry and corporate levels, the results of which will provide some input into plausible organisational structures in the future multimedia industry, assuming that industry development follows the globalisation potential.

A business that has global characteristics should be managed around a centralized hub. Businesses with multinational characteristics should be managed as decentralized federations. (Bartlett 1998:322)

Bartlett and Ghoshal recommend using the model to identify specific characteristics of the organization's structure that can be leveraged or adapted in order to build what they call "transnational capability". In figure 29, I have positioned the activities of the emerging multimedia value chain within the matrix of Bartlett and Ghoshal. The rationale for the individual position of the activities will become more obvious following the analysis of globalisation potential on the corporate activity level at the end of this chapter.

Figure 29: The anatomy of a transnational - applied for the multimedia industry



The activities are discussed in detail at the end of this chapter. However, what can already be seen is a significant difference in the characteristics of "terminal vending" and "service packaging", which are positioned at opposite edges of the figure.

4.3.2 The dynamics of network-based business

The anatomy of the transnational provides a generic framework that helps to analyse the potential within an industry. Besides the potential, each business or activity has special dynamics that are shaped by customer needs.

The multimedia industry is particularly interesting due to the different dynamics of individual activities. Some elements, like terminal vending, have global characteristics, assuming that technical standards are established.

The deregulation of network-based businesses brought a new problem into the discussion, as usage patterns and customer needs within a network are not spread equally in a given geographical coverage. There are routes with high usage patterns, for example, the autobahn between Frankfurt and Munich. Other concentrated areas of high usage are the banking centres of London, Frankfurt, and Zurich.

These usage patterns have been analysed by Kevin P. Coyne and Renée Dye. I will first introduce and afterwards apply the concept of "The Competitive Dynamics of Network-Based Business" (Coyne 1998) in addition to the anatomy of a transnational for the industry analysis of the activities in which these usage patterns seem relevant.

I will introduce the patterns with multimedia examples and apply them later in this chapter. In reality, several patterns can overlap, or a combination of lane- and zone concentration may produce the most appealing business case.

4.3.2.1 Zero concentration

Zero concentration was the underlying legal assumption for the public service obligation of the incumbent fixed network provider. The network had to be established in a way that customers could use the network for the same tariff independent of their location.

> *When in aggregate, customers use a network truly at random, the resulting pattern is zero concentration....*
> *In zero-concentration patterns market share is tightly related to the scale of the network. The relationship is not linear, however. At first, adding an outlet (and it's links) will only slowly increase market share. But when the number of outlets- and hence, the number of links- increases beyond that of most other competitors, share will rise sharply.(Coyne 1998:102)*

An example of zero concentration is the introduction of new mobile technologies, like short messaging services (SMS) and multimedia messaging services (MMS). The

marketing power and the value to the customer are increasing with the growth of the networks and number of users. Users are travelling throughout the country and want to communicate to their business partners, friends, and family.

However, a concentration given through national borders or technology changes will limit the usability and reduce the value* of these new services. Incumbents, as well as the new entrants, are currently searching for specific usage patterns to provide focused services where high returns are expected.

4.3.2.2 Lane concentration

Lane concentration can be found in the communication patterns between business centers or partners. The construction of infrastructure for lane concentration is purely an economic case that looks at the communication concentration between different points. The application of lane concentration is heavily used in public transportation systems, in which transportation is provided on the travel demand of passengers.

> *"Lane concentration tends to appear whenever a concentration of individual links is high enough to justify a dedicated system to serve them. Lane specialists compete with two main cost advantages. First, and most important, they carry only the most profitable links and outlets so they don't need to subsidize the less profitable ones. But, second, these new entrants often enjoy the potential of much lower labour costs." (Coyne 1998:104)*

Due to the concentration of businesses in special geographic regions and the deregulation of communication, incumbent telecom operators, as well as new entrants, became more aware of lanes. Immediately following deregulation, several international lines that were originally set-up on the interconnection system were substituted by new end-to-end lines between business centres. In the case of Switzerland and Austria, the route between Zurich and Vienna provided some opportunities.

* Different mobile technologies reduce the value for global traveler or demand specific devices being able to handle several technologies

4.3.2.3 Zone concentration

Zone concentration is creating opportunities for specific usage patterns within explicit zones. Typical examples are the banking zones in London, Zurich, and Frankfurt.

> *"In many networks, large numbers of customers concentrate their usage in some portion or portions of the network. In such cases, it makes strategic sense to think of the network as separate zones of concentrated use." (Coyne 1998:102)*

Colt Communication was an early new entrant that focused on the banking zones by building infrastructure limited to these zones and providing dedicated services for the banking industry. Besides zone concentration, Colt leveraged its investment in a second step by leveraging the lane concentration between the financial centres.

Another interesting aspect of zone concentration are cross-border regions. The area of Lindau (D), Bregenz (AT) and St. Gallen (CH) is a typical example. Many companies in this area have subsidiaries across the border whose goal it is to leverage specific business opportunities, or extend their geographical coverage without spreading the company too thin. Based on the interconnection system, these companies had high international communication costs for communication within a short distance. However, deregulation and this kind of zone concentration created business opportunities.

Zone concentration has a national as well as international flavour. Today, geographical databases support the process of analysing the economic potential for specific zones.

4.4 Globalisation potential of the multimedia activities

I have now introduced the concepts for analysing the activities in the multimedia industry.
The arguments for the deconstruction of the value chain, as well as the horizontal implications of industry trends, have provided the basis for analysing the industry on a corporate activity level.

On this level, I can analyse the activities for their potential for globalisation. I will look at the activities under two perspectives:

- The anatomy of the transnational. Zooming from the level of the converged value chain into the corporate activity level provides some insights into the differences in the globalisation potential within a horizontal layer. The individual activities will be positioned regarding their main characteristics.

- "The Competitive Dynamics of Network-Based Businesses" will be applied where a strong reasoning supports the usage.

The resulting activity framework for the multimedia industry is designed for the corporate strategy process. The level of detail helps to sketch the industry scenarios in enough depth under the given uncertainties.

4.4.1.1 Terminal vending

Terminal vending is the most visible activity within the multimedia industry. Every consumer has direct contact with physical devices like TV's, set top boxes, mobile phones, and regular fixed net phones. The devices transmit and transform the information to and from the end-customer.

The list of devices shows that the terminals have to fulfil several important functions. The classic terminal device was designed for one specific function like voice or data transmission.

Today, terminals are the place where convergence and globalisation can be observed best. The latest generation of mobile phones can be used to make regular phone calls, transmit data, access the Internet, and take photos. Furthermore, all of these activities can be carried out on an international basis. The Nokia 3650 in figure 30 is a typical example of this generation of terminal devices.

Figure 30: Nokia multimedia terminal

source: Nokia 2003

The terminal vending market is already a global market for which competition is increasing. Some terminal devices, like TV's, were not regulated, while deregulation of the telephone market was accomplished in the early 1990's. Well-known terminal vendors include Cisco*, Panasonic, Sony, Ericsson, Nokia, Siemens, and Motorola.

Traditionally, the telephone handset market was a national market, for which the telecom operator certified, sold, and maintained terminal devices under the telecom brand. In the face of deregulation, this market was the first activity of the telecom value chain that was opened to competition. New technologies, competition, and the growing trend towards standardisation drove globalisation in the terminal vending market.

Standardisation can be observed in several areas, which the following industry examples provide:

- The initial ISDN equipment had a national extension that needed to be implemented in each devise in each country. As this business became more

* IP-Phones

global, the "EURO ISDN" standard was established, which enables most terminal devices to be used at least all over Europe (as opposed to the telephone plug, which is still different in individual European countries).

- Mobile phones used to only work on national standards. A different phone was necessary for each country. With the emergence of GSM, three different frequencies, GSM 900, 1800, and 1900, are now used in a large portion of the mobile networks. Today, GSM mobile phones are able to handle all three frequencies in Europe, the US, and other GSM countries.
- IP (Internet Protocol) is already a global standard. Companies producing Internet Terminal devices already develop truly global products (sometimes bundled with national power supplies since the Electricity network is still not global).

The change in technology from analogue telephones to ISDN and xDSL, as well as the emerging mobile technologies GSM, GPRS and UMTS*, has increased the functionality of new terminal devices and customer demand for new devices.

Considering the stability of the analog telephone market over several decades, the current speed of innovation is completely changing the industry structure. R&D budgets, which need to be increased dramatically, are creating high barriers to entry for new players.

Competition has been enforced on a global scale. Marketers have been fascinated by the growth rates and the potential for globalisation in the terminal vending market. The dominant vendors on a national level have attempted to expand their geographical coverage while being faced with competition in their home market. At the same time, new entrants who have focused on new technologies, have been able to find their way into the industry.

For example, in 1984 Cisco developed an IP Router which is dominating the Internet backbone market and becoming more and more relevant in the terminal market. In another example, Nokia and Ericsson were hardly known by end-users before the first mobile handsets became popular. Today, their brands are strong in the mobile phone market.

However, competition is so strong that Ericsson has not been able to leverage its market share and brand. Therefore, Ericsson entered into a joint venture with Sony. The mobile phones are now sold under the "Sony Ericsson" brand. In the mobile phone market, it is expected that at most three major players will survive.

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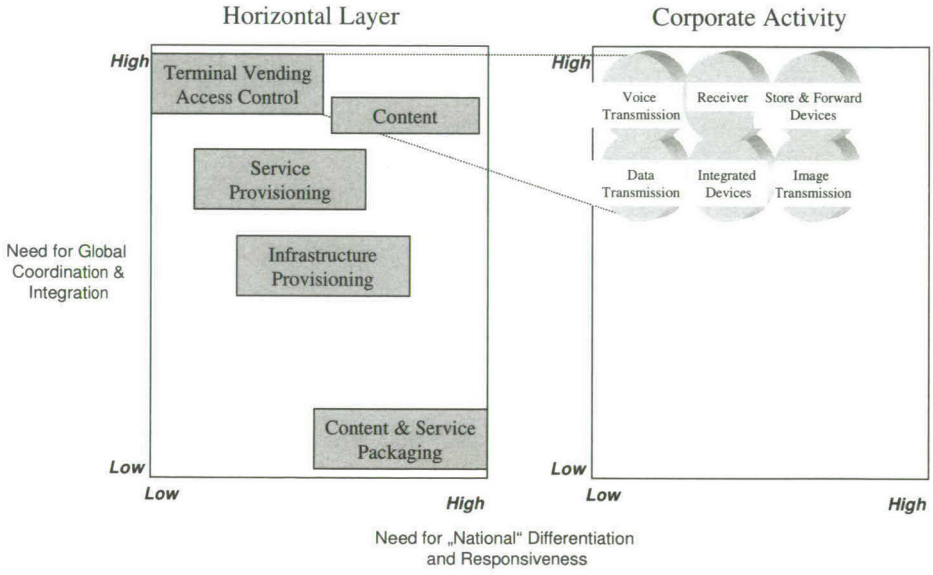
* GSM = Global System for Mobile Communication
GPRS = General Packet Radio Service
UMTS= Universal Mobile Telecommunications System

Today, the terminal vending market has a high globalisation potential, but is already deregulated and dominated by global companies. Competition is high and markets are consolidating on a global scale.

From a market perspective, there is zero concentration in the terminal vending market. Segmentation is related to usage patterns for which some areas are more apt to have the latest type of lifestyle terminals. These markets are preferably used as test markets.

Globalisation drivers position all of the corporate activities in the upper left corner with a high need for global coordination and a low need for national differentiation.

Figure 31: The anatomy of a transnational – Terminal vending



4.4.1.2 Content originating

In 2007, the Internet will have more Chinese websites than English websites. This statement about content was made by IDC, and changes the unofficial rule that the Internet is global and in English (IDC 2001).

The term "content" became popular in German-speaking countries with the emergence of the Internet. Within the Internet community, content is a generic term used to describe all kinds of electronic information and applications that can be accessed via the Internet and is available on a global scale. In the context of the multimedia industry, content originating has several sources, from pure information services, newspapers, films, and commercials to archives, databases, and stored communication.

The convergence of different media types has already taken place. The same information is printed and published electronically for all kinds of content sources.

The merger between AOL, a leading international Internet service provider, and Bertelsmann, an international German-based publisher, is an indicator that convergence is happening on an industry level. Originally, AOL was seen as the crown jewel in this merger. However, analysts' opinion of AOL Bertelsmann has changed recently. Following the downturn of the Internet and a change in the company's management structure, it is the Bertelsmann part of the merger that is now seen as the key element for the merger's success (Sirower, Financial Times; Aug14, 2003).

Content is produced as information, applications, movies, news, aggregated information, and commercials. The activity content originating can have all kinds of qualitative and geographical facets.

The market drivers for movies, information, applications, and news in terms of globalisation potential are fairly similar. They all have needs for global coordination, as well as national differentiation. A few examples will support this statement:

- With the emergence of the Internet, more and more Internet sites will be published in local languages or will just be relevant for specific regions. As a result, the Internet is global in terms of access to the information, but the content itself may have national, regional, or language-specific sources. In practical terms related to the introduction of this section, this means that all Chinese people living or travelling in the States can access their Chinese content on the Internet*.

* Quite interesting detail in "globalisation" - The PC needs to be enabled to display the Chinese character set, which is 16bit based to be able to display the variety in opposite to our 8-bit character set.

- The movie industry provides global content. For example, the new James Bond movie will be shown all over the world almost at the same time. However, at the same time, local TV stations to serve local demand are still emerging.
- The newspapers provide political and economic information on a global scale through information companies like DPA and Reuters. With the same intensity, they provide national and local news, for which they have their own reporter, or local news agencies.

The activities "aggregated information" and "commercials" are different in this respect, that is, aggregated information addresses a specific target group, for example, a business-oriented group or a private interest community. However, the underlying assumption is that we have a type of content which can be aggregated to specific needs. Plausible applications for this type of content include specific weather conditions for outdoor activities within a region, or a collection of marketing information about the Frankfurt region.

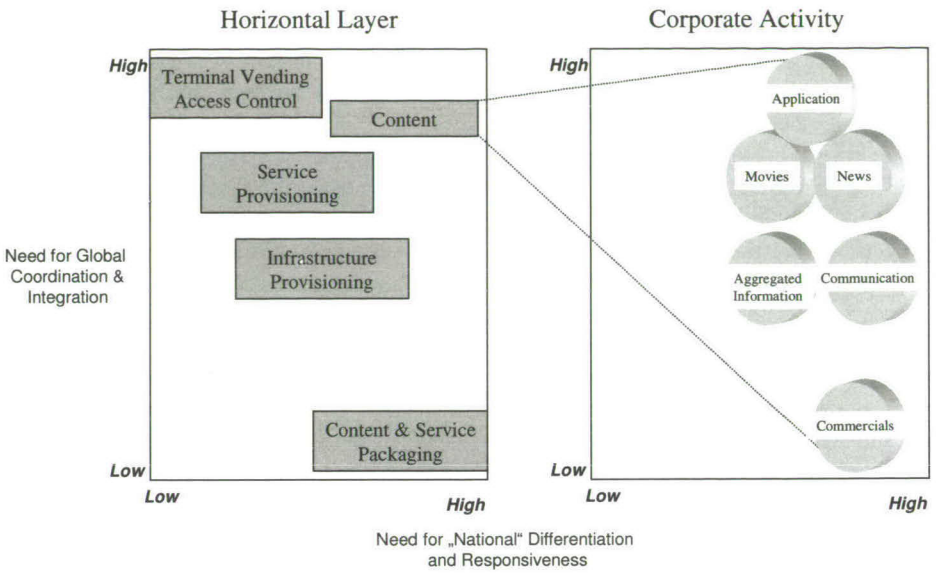
Commercials are aimed to address specific customers with specific messages. The quality is measured in the success rates. The better commercials are targeted to a specific nation/region, the higher the possible success rate. Therefore, the marketing industry is spending large sums of money to create commercials in a form that speaks to the local markets.

Putting the aspects together in the anatomy of content originating, we have a fairly differentiated picture. I positioned the big cluster with similar characteristics in the upper right corner, since we have high global as well as national needs.

Besides that, I positioned aggregated information in the middle. Due to its specific nature, there is no position that would characterise the majority of the business. Commercials are characterised by a target specific positioning, which is for the most part nationally oriented.

The examples for all activities have shown dynamics for zone and lane concentrations which can be exploited as activities within a company or by focused companies.

Figure 32: The anatomy of a transnational – Content originating



4.4.1.3 Content & service packaging

The content and service packaging layer collects the content and packages it with the transportation infrastructure and terminal devices to meet customers' specific needs. Traditionally, telecom operators fulfilled this activity for its services. Following deregulation and the emergence of convergence, this position has slowly eroded and will change even more in the future.

The content & service packager "owns" the customer end of the value chain. He has the customer interface and collects the money. This position is the goal of most players in network-based industries, assuming that this position will control the value system and generate the highest returns. As a result, we see the highest degree of competition for these corporate activities along the value chain.

Telecom operators are traditionally and theoretically in a strong position, because they know all of their customers. However, from a practical standpoint, customer data is often not available in a form for a telecom operator to utilise this advantage to achieve short-term gains.

Market growth is attracting several industry participants who wish to enter this field. The main issue is strong customer contact. Mobile phones can be purchased at the gas station, and in the electronic shop, the supermarket, and the telecom shop, something that was not possible ten years ago.

A special position is emerging with the so-called "network independent service provider". These service providers do not own any physical infrastructure. Instead, their core competence is packaging and retailing network capacity and terminals for consumers. Debitel, Mobilcom, and 1&1 are entering the German market with this business model. The position of Debitel is described in its vision statement:

> *"Together we will strengthen our leading position as a network-independent provider of mobile-telephony and multimedia services in Europe. We will be top performers and will create lasting value." (Debitel 2003)*

In the long-term, I assume that both the multimedia and the consumer retail specialists will acquire some market share. The scale of each model is uncertain, and depends on national industry structures and the performance of the involved players.

The globalisation potential and dynamics have to be differentiated, for which I am only able to scratch the surface. Further studies could provide more insight into the scalability of process design for transnational organisations.
The process design, tools, and contracts with suppliers can theoretically be developed to leverage the economies of scale. Up until now, practical experience has reduced the advantages from global systems in this field. Processes, contracts, and service tools

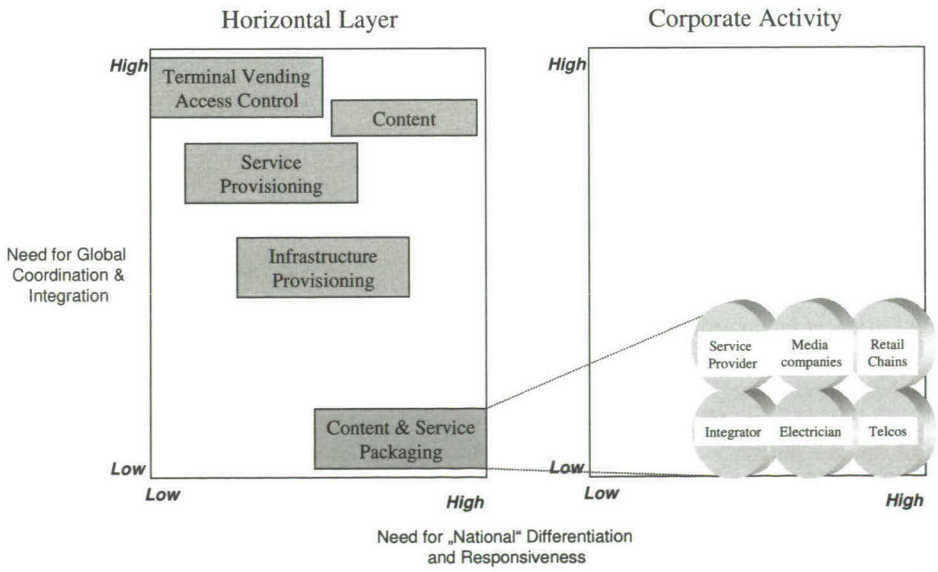
are still to a high degree developed specifically for local markets with the advantage of speed and flexibility.

However, customers and markets are different on a national basis. Marketing programs are launched by the competition on a daily basis to gain new customers and market share. The packages themselves have to be customized and provided to the individual customer on a national level. The high degree of competition requires intense work to build up brands and differentiate a company's services on the market. Speedy reactions to the needs of local customers make the difference and eventually determine who the "winner" in the market is.

A different aspect can arise when looking at the dynamics of "content & service" packaging. The majority of the business is the consumer side, with zero concentration. However, there may be specific target groups that demand multimedia services in certain zones. The aspect of zone or lane concentration can be seen for specific niche markets. Examples include access to wireless LAN networks on the major airports from a single packager, access to stock information and trading in the financial centres, and logistic services on a global scale as a packaged service with a national network operator.

For these reasons, I have positioned the corporate activities in the bottom right corner, arguing that "content & service packaging" requires a strong national differentiation. The dynamics of lane and zone concentration are visible, but relevant only for niche market positions.

Figure 33: The anatomy of a transnational – Content & service packaging



4.4.1.4 Service provisioning

Service provisioning can be the major differentiator for success in the future multimedia industry. The new possibilities for customer service, from service management of transport services to CPE management, IT-processes for ordering and information or application- and billing services, were discussed under the topic "technology trends" (c.f.3.3.).

The service aspect of a classic telecom operator was illustrated in the telecom operator map. Service provisioning used to be a process handled within the value chain which was under the complete control of the incumbent. The incumbent's value chains are still vertically integrated, historically grown and complicated to be automated. However, this will change with the emergence of the multimedia industry, and contains several aspects for managerial attention.

From the long-term perspective, service provisioning offers some potential for profitable business models and globalisation of the processes. Achieving the economies of scale in IT-based service processes is the globalisation driver for new entrants, as well as the incumbent.

The theoretical options for "self-service web applications" are currently the service quality and cost differentiator in the multimedia value chain. Currently, just few players have implemented these options successfully to acquire a better service, or at least cost position.

One of the best-known implementations of global service provisioning is the Dell Computer business model. Michael Dell has gained a competitive advantage by using different combinations of face-to-face, ear-to-ear, and keyboard-to-keyboard service processes. By moving routine interactions to the Web, Dell has enabled customers globally to conduct many service tasks on their own.

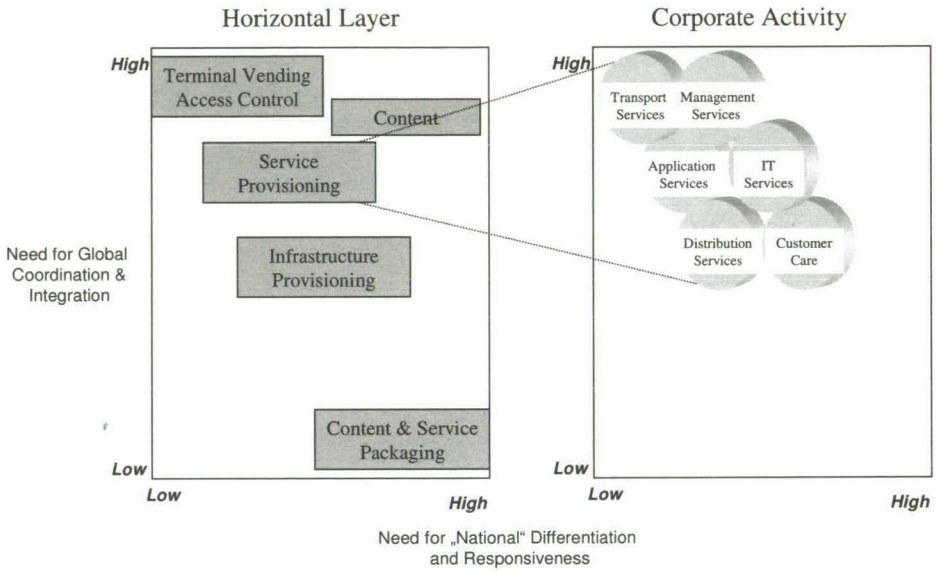
Focused exploitation of the possible strategic positions is currently at an early stage in the industry. The emergence of the multimedia industry is characterised by the changes in technologies, marketing programs with the bundling of services, and reseller functions within the process design. To fulfil these service aspects economically to achieve the desired customer satisfaction is quite a complex task. In the future, service provisioning for multimedia activities will provide a high potential for the creation of new services and provisioning services on automated platforms that are accessible with multimedia terminals.

Service provisioning is a task that can be highly automated and be deployed on an international scale. The example of Dell shows how service provisioning in the multimedia industry has a high globalisation potential driven by cost and market drivers.

In the future, the economics of service provisioning will be based to a high degree on IT investment and process design. Scale is the important aspect for economic success. I argue that due to the economics and the nature of service provisioning, service activities have a high potential for global coordination and integration.

The dynamics of service provisioning are fairly neutral. Once developed, services can be accessed at each point where a network connection exists, and the usage follows the dynamics of the underlying or overlay activity in the vertical value chain.

Figure 34: The anatomy of a transnational – Service provisioning



4.4.1.5 Infrastructure provisioning

Infrastructure provisioning is the most capital intensive activity within the multimedia value chain. The globalisation potential differentiates between the various areas of the infrastructure (c.f.1.2.4) and business, and is strongly influenced by the economics of telecommunications regulation (c.f.2).

Telecom operators, who traditionally have owned the entire access, backbones, and switches, will see in analysing their growth opportunities that the potential differs significantly between the types of infrastructure. Some parts provide excellent potential for international expansions, while others are physically restricted to national use. However, on the national side, there may be opportunities due to technical convergence and innovation that are not investigated within this book. (xDSL)

The access cable infrastructure, the most expensive part of the network, provides almost no globalisation potential. The extension of the physical access network would provide no direct cost or marketing advantages on the infrastructure level. However, the potential may look different on the service level. An international strategy using access cables in a foreign country should be based upon the use of available interconnection possibilities (c.f.2.3.3). On the other hand, access satellite infrastructure is designed to be accessed globally. Therefore, I do not see a reason for strong national differentiation.

In its technical nature, mobile access is similar to fixed access. The local loop simply works on radio frequencies instead of a fixed cable. However, mobile services and usage are in by nature international. Therefore, the rationale and potential for globalisation need to be discussed on the service and service packaging level.

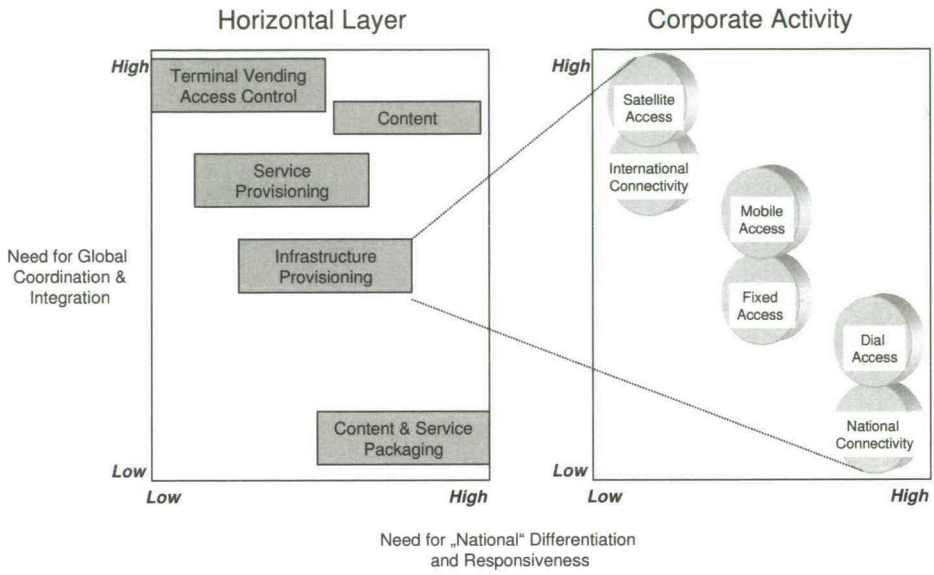
Backbone infrastructure was already discussed under the globalisation drivers (c.f.3.4.1).
The backbone cable utilised under the dynamics of lane concentration is an example in which the cost drivers create the globalisation potential.

The emergence of the multimedia industry is changing the technologies and the life cycle of the active devices. With the ever-increasing computer power, they often reach a stage of under-utilisation. The potential and the need for global extension can be argued by these changes. New devices now meet global standards, which enables immediate deployment in several countries.

However, these standards also change the economies for the operator. Telephone switches used to have a depreciation time of several decades. However, equipment now purchased for the multimedia industry will be obsolete in just a few years. To achieve the necessary economies of scale, the multimedia operator will need to connect as many customers as possible, as quickly as possible, to the active device.

The dynamics of the network-based business can be fully exploited in the activity infrastructure provisioning. While the incumbent traditionally has a zero concentration within a particular country, it may leverage international expansions in focusing on the dynamics by providing several lane and zone concentrated services.

Figure 35: The anatomy of a transnational – Infrastructure provisioning



4.5 Activity framework for the multimedia industry

The analysis of international potential in the emerging multimedia industry raised several questions, which I could answer in part in this chapter. The future perspective of the multimedia value chain in comparison to the traditional perspective of the value chain analysis provided a good starting point. However, the value chain did not contain any international aspects, and the level of detail was not appropriate for the corporate strategy process.

In this chapter, I will carry out several steps toanalyse the emerging multimedia industry. One of the key differentiators compared to traditional industry analysis (Porter 1980) is that all steps are performed keeping the future multimedia activity in mind and referencing the current situation as a learning experience.

1. The first step is the introduction of the theoretical background that supportsthe argument for the deconstruction of the value chain into individual activities, thereby creating the perspective of a value system.

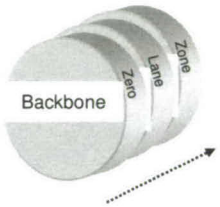
2. The second step involves the introduction of the corporate activity layer, for which I argue that the activity level may serve on a regulatory level, but that this level is not detailed enough on a corporate level. Therefore, I create a detailed activity view for the corporate level. Each activity is assumed to have a size which could itself form a business.

3. Afterwards, I analyse on the corporate activity level the globalisation potential by applying the concepts of the "anatomy of a transnational" and the "dynamics of network-based business".

The three steps together create a picture of the overall international potential in the multimedia industry. For a graphical representation of the global dimension, I have used the two dimensional perspective (c.f.4.2) and have added the international perspective indicated by an arrow and the zero, lane, and zone activities. Figure 35 shows the backbone activity, which is positioned on the horizontal layer of "infrastructure positioning". Within this third dimension, the dynamics and potential for globalisation of the individual activities are shown.

The visualisation with zero, lane, and zone means that each activity should be analysed individually to determine globalisation potential under the dynamics of network-based businesses. However, the concept provides the strongest evidence for the infrastructure-based activities.

Figure 36: Globalisation potential in the individual activities



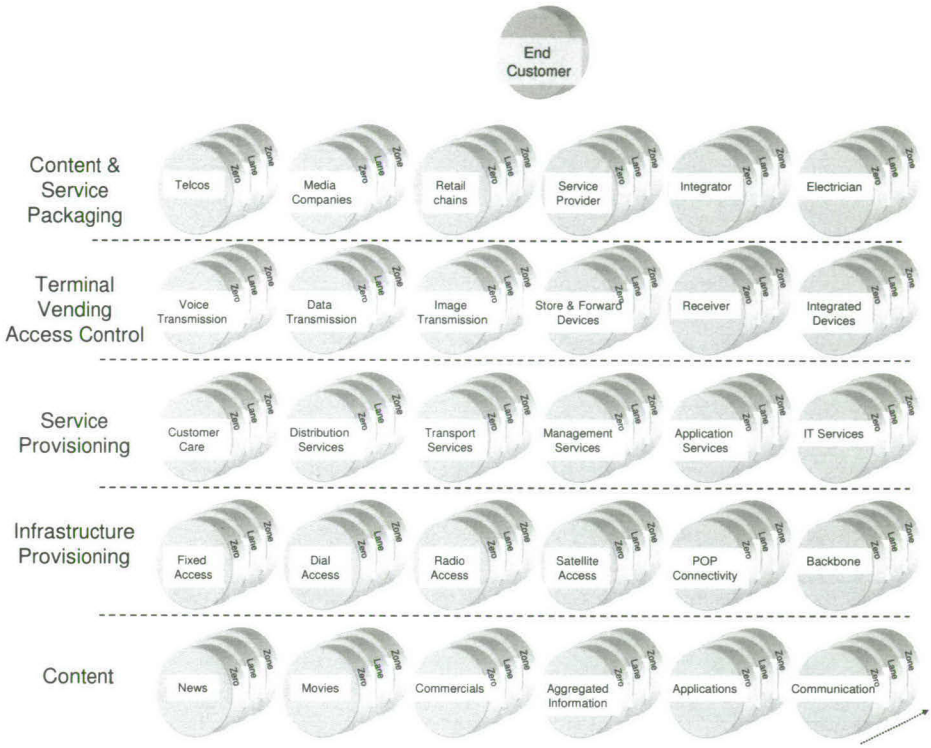
On the following page, I have added the third dimension symbolising the international aspect of all activities defined in the activity system (cf 6.2).

As a result, I can now construct the "activity framework for the multimedia industry". The interpretation of the graphical representation is the analysis of the individual activities in section 4.4. Figure 36 shows a graphical representation of the total multimedia industry.

The Y axis represents the horizontal layers of the multimedia industry on a high level as a value chain of the converged multimedia activities.

The X axis breaks each activity down into several activities on what I call the corporate level.
The third dimension, the Z axis, represents the globalisation potential.

Figure 37: The activity framework for the multimedia industry



This framework can be used for several purposes, namely:

- To locate positions of potential corporate activities,
- To spin the activity network from different customer perspectives,
- To analyse activities with similar dynamics that fit to existing core competencies.
- To exclude activities that do not contribute to the corporate strategy discussion (A point often neglected in corporate strategy discussion).

The important issue here is that different questions and trends are integrated in one concise industry framework, which assists in the corporate strategy process by assuming that all activities play a role as future multimedia activities. The framework will be applied in the corporate strategy process in chapter 6, following the analysis of the multimedia industry organisation in chapter 5.

5 Multimedia industry organisation

The development of the telecom arena towards the multimedia industry has some clear trends which were analysed in chapter 3. These trends are expected to lead to the convergence of the telecom, IT, and media industry toward the global multimedia industry. However, besides the confidence that these trends will occur and the understanding of what they mean, I have pointed out the uncertainties in the emergence of the multimedia industry.

The analysis of the deregulation process and industry trends brought about several questions of the organisation in the future multimedia industry.

- The traditional telecom set-up is vertically oriented (c.f.1.2.4). Will the traditional vertical integration still be the industrial organisation of the future?

- Will the economies of scale and scope be achieved through national convergence (c.f.3.2) or global delivery (c.f.3.4/4.4), or will certain elements of the value chain reshape the industry structure (c.f.3.4) towards horizontal organisations?

- Will the merger and acquisition activities (c.f.3.5.1) and new technologies (c.f.3.3) force a combination of vertical and horizontal organisations, or will networks of micro companies be the dominant factor in the multimedia industry?

The combination of the different uncertainty factors influencing industry development is quite complex. The literature and consulting publications do not provide a concise model for the integrated industry development. However, there is some evidence that the development of the emerging multimedia industry is very uncertain. The problem of uncertainty in the multimedia industry is discussed extensively in the managerial journals *Harvard Business Review* and *McKinsey Quarterly*.

To gain a feeling for the relevance of the problem, I conducted a search of these journals. The keywords used were "uncertain", "telecom", and "Europe".

The *McKinsey Quarterly* search identified thirty-eight articles from 1998 to 2002* about the uncertainties in the telecom industry. This is quite an impressive number, as the journal is published only four times a year.

* http://www.mckinseyquarterly.com/home.asp?tk=mfladung:: accessed on March 12,2003

The same query of the *Harvard Business Review* site identified a collection of articles on managing uncertainty (HBR 1999). The traditional strategy approach for situations of uncertainty is questioned by several of the authors of the respective article, who offer a variety of suggestions for handling uncertainty on a managerial level.

The underlying hypothesis for this book is that although there are a wide variety of trends and uncertainties within the emerging multimedia industry, a part of this uncertainty is manageable.

The results of the literature search confirmed that corporate strategy for a given problem cannot be defined by setting a traditional strategy with a discounted cash flow analysis as the result. Instead, some sophisticated analytical tools are needed to handle the uncertainty. One of the important preparations for this book was choosing an appropriate methodology to handle the uncertainty, which can make the strategy process more meaningful.

In the following chapter, I will to provide a perspective on how industry organisation can be analysed from a managerial perspective and will develop a model of potential industry developments that can be applied to the corporate strategy process.

First, I will show how the topic of uncertainty can be handled in the strategy process and which analytical tools support management in handling uncertainty. One of the concepts that I have developed for a given level of uncertainty is scenario planning. In a second step, I will introduce the scenario planning methodology, and then apply it to the development of the multimedia industry scenarios.

5.1 Strategy under uncertainty

Corporations are constantly faced with defining strategy in uncertain environments. Regarding the topic of uncertainty, economic theory focuses on the probability functions of events and behaviour[36]. These elements are quantitative in nature, and a lot of progress has been made in integrating the uncertainty into economic models. However, not all empirical or managerial uncertainties can be handled using this approach.

> *"At the heart of the traditional approach to strategy lies the assumption that by applying a set of powerful analytical tools executives can predict the future of any business accurately enough to allow them to choose a clear strategic direction. But what happens when the environment is so uncertain that no amount of analysis will allow us to predict the future?" (Courtney et.al. 1999)*

Strategy literature defines the term uncertainty in a broad context and usessupporting tools for the different types of uncertainty. Arie P. De Geus proposes using non-traditional approaches, namely a set of several tools, for handling uncertainty.

> *"What-if scenarios, computer modelling, and interaction with consultants are among the methods Shell uses to help operating managers stay in tune with an inconsistent world." (Geus 1997)*

Gary Hamel and C.K.Prahald (Hamel 1994), Adam M. Brandenburger (Bandenburger 1995), and Kathleen M.Eisenhardt (Eisenhardt 1998) are among the contributors to a *Harvard Business Review* collection with different techniques, tools, and behavioural attributes for handling uncertainty.

The differentiation between risk and uncertainty is extended during the stage in which uncertainty in the industry is growing. Kees van der Heijden goes a step further by adding a third category to risk, and what he calls structural uncertainties. He calls this third category "unknowables".

> *"Unknowables, where we cannot even imagine the event. Looking back in history we know that there have been many of these, and we must assume that this will continue in future. But we have no clue what these events could be."* (Heijden 1996).

The tools for incorporating uncertainty in the corporate strategy process are developed and applied differently, depending on the given situation and are supposed

[36] The histoty of "uncertainty" in the economic literature from Knight over von Neumann Morgenstern to Kahnenman is covered in the Appendix - Uncertainty

to increase managerial efficiency. However, the choices available do not answer the question of which tool will serve the given situation best.
A structure classification for handling uncertainty was introduced by Courtney, Kirkland, and Viguerie in their article "Strategy under Uncertainty" *(Courtney et.al. 1997)*. In this section, I will introduce their classification of uncertainty as the underlying decision criteria for choosing the tools to handle uncertainties in the multimedia industry.

In Part I, I analysed the deregulation process and ongoing trends in the multimedia industry. The analysis provided some concrete insights and, at the same time, several uncertainties. The uncertainties range from a clear direction with an uncertain scale to concrete options and a wide selection of possible futures. Courtney, Kirkland, and Viguerie propose differentiating between certain elements and the residual uncertainty, the last for which they put into four classes:

Level 1: A Clear – Enough Future

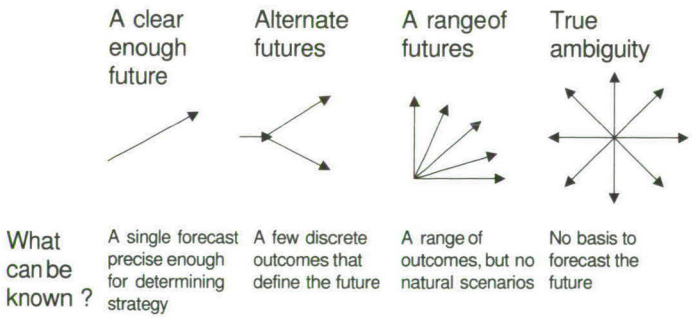
Level 2: Alternate Futures

Level 3: A Range of Futures

Level 4: True Ambiguity (Courtney et.al. 1997)

The following figure provides a graphic representation of the different levels of uncertainty based on the work of Courtney, Kirkland and Viguerie.

Figure 38: Level of uncertainty



source (Courtney et. al. 1997)

Based on the level of uncertainty, they propose the analytical tools and examples for strategy shaping. Each level of uncertainty demands different actions from management.

- With a clear future for the dominant technology, management can focus on educating employees, developing a superior product, and analysing the market and competition with the "traditional strategy toolkit". The growth rate of IP-based services is a typical example, where the direction is fairly clear, but the rate and speed are uncertain.
- In cases where concrete options are given and competing for resources, other methodologies can support management more effectively, assuming that the option is to enter alternative countries or acquire different companies to extend the company's scope. Each option creates a business case in its own right, but the business cases are competing for resources. In this case, option valuation and game theory provide more insights and clear reasoning.
- With an increase in the level of uncertainty, managers and strategists try to understand the parameters of the uncertainty and create scenarios or models to benchmark managerial actions against these models. Scenario planning and non-linear models are tools that support the strategy process.

The matrix below gives an overview of the level of uncertainty and recommends an appropriate analytical tool to solve the problem.

Figure 39: How to use the four levels of uncertainty

	A Clear-Enough Future	Alternate Futures	A Range of Futures	True Ambiguity
What can be known	A single forecast precise enough for determining strategy	A few discrete outcomes that define the future	A range of possible outcomes but no natural scenarios	No basis to forecast the future
Analytic Tool	"Traditional" strategy tool kit	Decision analysis	Latent-demand research	Analogies and pattern recognition
		Option Valuation	Technology forecasting	Nonlinear dynamic models
		Game Theory	Scenario Planning	

source (Courtney et. al. 1997)

The industry organisation of the emerging multimedia industry is characterised by high ambiguity through the complex combination of uncertain trends. This situation raises the question of how the uncertainty in the corporate strategy process can be handled efficiently.

Researchers have developed a set of analytical tools to manage uncertainty. Choosing the appropriate tool and integrating knowledge about the residual uncertainty delivers an output which supports management in its decision-making process. The question about the future industry organisation in the emerging multimedia industry is based on several uncertainties. In this chapter, I will apply suitable analytical tools to develop representations of a possible future. Based on these models, I can demonstrate how the corporate strategy process is manageable despite the given uncertainties in the development of the multimedia industry.

The type of analytical tool applied in the strategy process depends on the character of the problem. To handle uncertainties with a range of possibilities, as in the development of the multimedia industry, latent demand research, technology forecasting, and scenario planning are the proposed types of methodologies. (Courtney et al.1999)

For information based mainly on quantitative data, as in any performance planning cases or demand forecasting areas, "latent demand research", as well as "technology forecasting", are the methods of choice. Both methods serve in the strategy process to evaluate the future potential for market entries and corporate positions. However, these methods lack the incorporation of qualitative information.

The problem of future industry organisation in the multimedia industry has a range of possible solutions which are qualitative in nature. An analysis of the multimedia industry delivers a complex set of trends, the analysis has so far been a purely qualitative process.
In this environment, scenario planning offers the capability to define the possible future stages that may exist in the qualitative perspective. Developing pictures about the potential industry structure in the multimedia industry can be the next step.

The character of the information, combined with the degree of uncertainty in the multimedia industry, provides the reasoning to apply scenario planning as tool for the analysis of industry organisation.

> *"Scenario planning is a regularly- used business tool at US-based clothing specialist Levi-Strauss as a way of considering options for decision-making. Issues examined could range from the extreme example of what would happen if cotton no longer existed, to the impact of the deregulation of the cotton industry in the US." (Ringland 1998:30)*

Scenario planning is applied in the context of industry analysis under uncertainties and deregulation in several industries. I have applied it in the context of uncertainties in the multimedia industry organisation, which has allowed me to gain meaningful results that support the corporate strategy process.

5.2 Scenario planning

The economics of telecom regulation, as well as the trend analysis, delivered a combination of different drivers that influence the currently vertically integrated telecom industry. Scenario planning is a tool that has the ability to handle a combination of qualitative characteristics with a future orientation applied to several competing trends. These features are needed to guide the industry analysis process in a structured form to the next level of understanding.

> *"When the world changes, managers need to share some common view of the new world. Otherwise, decentralized strategic decision will result in management anarchy. Scenarios express and communicate this common view, a shared understanding of the new realities to all parts of the organisation." (Wack 1985)*

Developing scenarios about possible future end-states of the multimedia industry is meant to provide an important basis for the managerial perspective in the corporate strategy process.

> *"Industry scenarios enable managers to identify plausible futures states of an industry and differences between them, to examine how these distinct states might evolve, and most important, to determine what the organization would have to win within each industry future." (Fahey 1998:189)*

Scenario planning was originally developed by Shell to analyse the future of the oil market. The best known developer from the group is Pierre Wack (Wack 1985), who, in 1985, published "Scenarios: Shooting the rapids". In the late 1990's, due to ongoing deregulation and the consolidation of several markets, scenario planning became more popular. Recent publications have come from Peter Schwartz (Schwartz 1996), Kees van der Hejden (Hejden 1997), Gil Ringland (Ringland 1998), Liam Fahey (Fahey 1998), and Arie de Geus (Geus 1997).
Scenario planning can be applied in several areas to create scenarios for the development of industries, technologies, or firms.

I will extend the described tools from Peter Schwartz, Kees Van der Heijden, Gil Ringland, Liam Fahey, and others to develop industry scenarios by using and enhancing methodologies To achieve a "sustainable" position, I have chosen a time horizon of ten years, which, based upon the current rate of change, can be referred to as long-term.

Fahey states four reasons for which industry scenarios support the strategy process:

1. *To identify plausible future states of an industry and the differences between them.*

2. *To show how each future state might evolve and to describe the different possible paths.*
3. *To foster better strategic thinking by helping to identify unanticipated marketplace opportunities and threats, and to illustrate competitive dynamics in different industry contexts.*
4. *To enable an organization to anticipate what it would have to do- at every level of the business- to win in various industry scenarios. (Fahey1998:191)*

In this chapter, I will develop the scenarios for the first reason, identify and differentiating between plausible industry futures. Based on the current structure of the telecom industry and the current trends, I will develop scenarios about future end-states within the emerging multimedia industry.

Reasons 2, 3, and 4 are applications during the corporate strategy process. This benefits of the scenarios developed with an international focus are tested at the end of this book.

The development of scenarios is a process which is not as straightforward as scientists would like to believe. Dealing with a high degree of uncertainty requires a methodology that also requires personal opinion and "trial and error" methods. Therefore, scenario building is not a clear step-by-step process. Often, scenario planners need to "rethink their thinking" until the results seem plausible and useful. However, over the last two decades, the application of scenario planning in the industry for a variety of needs has provided the expertise where to focus and how to proceed in this process. The process described by the various authors of scenario planning literature is similar regarding the steps necessary to arrive at scenarios, and more importantly, the application of the scenarios in the strategy process.

I will now introduce the process proposed by Peter Schwartz, who is one of the pioneers and proponents of scenario planning. He has designed the process using a straight-forward method that is easy for the reader to follow. This process is also recommended by Gil Ringland, who has been applying scenario planning for several years at ICL, and who has published the book "Scenario Planning: Managing for the Future".

> *"The best overall guide to process that we found was the checklist in Peter Schwartz's "The Art of the Long View". (Ringland 1998:81)*

The process to develop and apply scenarios requires eight steps:

1. Identify Focal Issue or Decision
2. Key Forces in the Local Environment
3. Driving Forces
4. Rank by Importance and Uncertainty

5. Selecting Scenario Logics
6. Fleshing Out the Scenarios
7. Implications
8. Selecting of Leading Indicators and Signposts (Schwartz 1996:241)

In this book, I will follow these eight steps in three main areas. I will bring together the first three steps, which were discussed in Part I of this book, to carry out the scenario planning process in this chapter. Steps 4, 5, and 6 are topics and developments that are discussed in this chapter. Steps 7 and 8 will be the result of combining the scenarios with the multimedia activity framework in Part III.

Step 1: Identify focal issue or decision

The question raised in the introduction was about international strategy in the emerging multimedia industry. Based upon an analysis of the environment, I was able point to a degree of uncertainty in the evolution of the industry, which in turn creates problems for the strategy process. By addressing this uncertainty, I could focus the problem on the question of the industry organisation.
The expected outcome of the scenario planning process during the industry analysis, according to Liam Fahey, should be some plausible future states of the multimedia industry and the differences between them (Fahey 1998).

Step 2: Key forces in the local environment

Key forces are described as "key factors influencing the success or failure of the decision"(Schwartz 1996:242). The development from the telecom to the multimedia industry is driven by several trends occurring simultaneously. These forces include regulation, technology, globalisation, and convergence (c.f.3.2-3.5). The impact of each force upon the industrial organisation in individual countries depends upon the overall development.
Following deregulation in 1998, telecom operators tried several different approaches to expand internationally. Up until now, few of these approaches have succeeded.
The question of international corporate strategy raised in this book is the question of scale and scope in an environment that is described by the boundaries of the global multimedia industry, which extend a long way to the current core competencies of a national telecom operator. The scenarios are meant to give decision-makers a guideline and monitoring tool during the international strategy process so that they can decide how to design the national and international organisation to create a sustainable multimedia organisation.

Step 3: Driving forces

Driving forces are factors that create uncertainty and change. Peter Schwartz calls it "the most research-intensive step in the process" (Schwartz 1996:243). The driving forces for industry development have already been discussed in detail in Part I of this book.

5.2.1 Step 4: Rank by importance and uncertainty

The combination of trends created an environment which makes managerial decision-making quite complex. The important step now is to focus on the key elements and the drivers shaping the future.

Scenario planners recommend investigating trends based upon their impact on the strategic question and the degree of uncertainty in the current environment (Schwartz 1996, Wilson 1998, Clemons 1998).

Peter Schwartz proposes a selection based upon importance and uncertainty:

> *"The point is to identify two or three factors or trends that are most important and most uncertain. Scenarios cannot differ over predetermined elements like the inevitable aging of baby boomers, because predetermined elements are bound to be the same in all scenarios." (Schwartz 1996:243)*

In a further step, he prioritises by importance and the degree of uncertainty.

> *" first, the degree of importance for the success of the focal issue or decision identified ...; second, the degree of uncertainty surrounding those factors and trends." (Schwartz 1996:243)*

His approach is similar to that of Clemens and Bradley, who go a step further by proposing a ranking of all trends according to uncertainties and importance:

> *"Rank the key uncertainties to determine the key drivers. Identify two or three most important unanswerable questions – the things that cannot be known, that if known, would tell strategic planners precisely what they need to know." (Clemons 1998:85)*

The methodology for the ranking documented in the literature ranges from a simple ranking (Schwartz 1996) to the application of the impact/uncertainty matrix. A comparable idea, but more systematic, is applied by Ian Wilson (Wilson 1998) and Friedrich Bock et.al.(Bock et.al. 1998:26). They all go into detail with a graphic positioning of the trends.

> *"In practice, a complex analysis is not required. ... To be systematic in this sorting process, you can use an impact/uncertainty matrix. .... As a result of this sorting, you can focus your attention and the search for scenario logics in the next step on:" (Wilson 1998)*

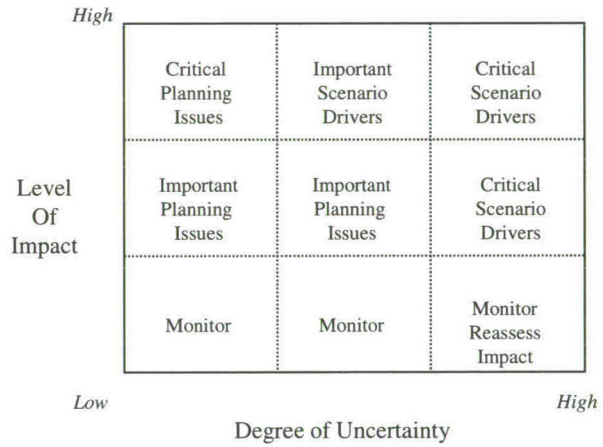
Impact/Uncertainty matrix

The impact/uncertainty matrix is a graphical representation of the impact (y-axis) and uncertainties (x-axis). The driving forces are positioned within this matrix, and has several effects which support the managerial decision-making process.

Uncertainty and importance are equally weighted, which is difficult to describe in a ranking list. The visual presentation puts the complex forces into one integrated picture.

The graphic below shows the impact/uncertainty matrix as proposed by Ian Wilson. The driver is positioned in the matrix.

Figure 40: Impact/Uncertainty matrix



Source (Wilson 1998)

The position in the matrix defines the relevance in the scenario planning process.

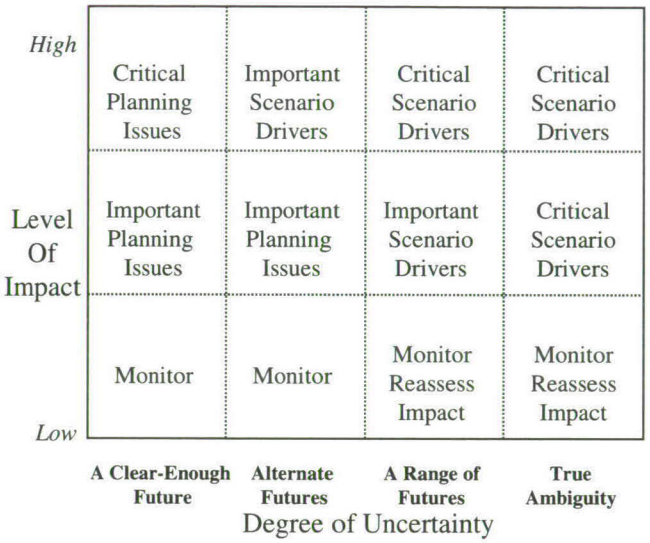
- *High-impact/low-uncertainty forces (those in the top left-hand cell). These are the relative certainties in your future for which your current planning must prepare.*
- *High-impact/high-uncertainty forces (those in the upper right quadrant). These are the potential shapers of different futures (scenarios) for which your longer term planning should prepare." (Wilson 1998:88)*

Bock et al. apply the matrix in the ambition-driven strategy concept from Arthur D.Little. For them, high-impact/high-uncertainty forces form the "zone of focus".

The areas with less impact follow in the implementation steps of the strategy developed for the high impact zones.

The impact uncertainty matrix has a simple granularity ranking from low to medium to high. After the discussion of the topic of uncertainty and introducing the levels of uncertainty, I argue that the methodology can be made more precise by extending the x-axis with the four levels of uncertainty (c.f.5.1). For the positioning of the multimedia trends I will use the following extended form of the matrix.

Figure 41: Extended impact/uncertainty matrix



5.2.2 Step 5: Selecting scenario logics

Up until now, all trends have been discussed individually and each trend creates its own logic. Articles about individual trends can be found in numerous computer and consulting magazines. The challenge lies in putting the trends together to create concise scenario logic.
This process is highly intuitive and combines empirical experience into a structured methodology. Peter Schwartz describes the process of generating the scenarios with the following words:

> *"While in the end one may boil the logic down to the directions of a very few variables the process for getting there is not at all simple or mechanical. It is more like playing with a set of issues until you have reshaped and regrouped them into such a way that a logic emerges and a story can be told." (Schwartz 1996:244)*

Ian Wilson points to the specific elements of scenario planning, where intuition and creativity play an important role.

> *"This step is the heart of this scenario development process. In it, you establish a logical rationale and structure for the scenarios you select to examine in depth. It is also the stage in the process where intuition, insight, and creativity play the greatest role."(Wilson 1998)*

The methodology for visualising the different possible end-states is the creation of a multidimensional space in which each driver or combination of drivers can describe a dimension of uncertainty. Typically, the axes defining the space point in different directions, each direction symbolising the extreme points of alternative futures.

5.2.3 Step 6: Fleshing out the scenarios

This section deals with the positioning of the key factors in the developed scenario logic. Peter Schwartz recommends the following:

> *"While the most important forces determine the logics that distinguish the scenarios, fleshing out the skeletal scenarios can be accomplished by returning to the lists of key factors and trends identified in steps two and three. Each Key factor and trend should be given some attention in each scenario." (Schwartz 1996)*

The graphical positioning within the scenario logic is the first step in describing a scenario. The positions define the possible future industry organisation, and have to be enhanced with the key drivers that have fewer uncertainties in order to create a comprehensive picture of the future end-state.

The number of possible scenarios in the scenario logic can be reduced by challenging the scenarios against several decision criteria. This is an intuitive process supported by some rational arguments. Criteria to challenge the scenarios include "plausibility", "differentiation to the other scenarios", "consistency", "decision-making utility", and "challenge organisation's conventional wisdom". (Wilson 1998).

The various scenarios are sketched in the scenario logic of the multimedia industry organisation. To be a useful communication and strategy tool, the scenarios need to be developed further as a storyline that includes the driving forces and development towards the end points.

> *"Remember that scenarios are not descriptions of end points (such as, How big will your market be in 2005?). They should be narratives of how events might unfold between now and a future date." (Wilson1998:91)*

An improvement in strategic thinking and strategic discussions is one of the purposes of the scenario planning process, in addition to the result of the scenarios. To accelerate the discussion further, scenario planners recommend naming and storytelling. Several of the authors state that naming the scenarios advance the strategic discussion. (Ringland 1998, Heijden 1997)

> *"We believe that one reason that this project worked better than our 1993 project was that we came up with names for the scenarios which described the essence of what we were talking about" (Ringland 1998:101)*

The introduction of creative thinking in the strategy process is fostered by telling a story about how the future could look like. The communication of the scenarios can be set free to force strategic thinking beyond the current mental boundaries.

> *The task before the scenario team is to find a way to develop the most interesting and enlightening stories. Scenario planners should feel free to engage their own creative talents to do this as they see fit. Interest and memoriability derives from originality which should have free rein". (Heijden 1997:213)*

Kees van der Heijden goes a step further by proposing that a professional storywriter be hired to create the interest and tension for the reader.

5.3 Developing multimedia industry scenarios

In this section I will develop the scenarios for the future structure of the multimedia industry. I will follow the process developed by Peter Schwartz by first defining the focal decision and afterwards, the key force for change (c.f. 6.2.). The analysis in Part I provided the foundation for the development of the scenario logic and integration of the trends.

Focal issue or decision

Industry analysis carried out for the purpose of defining international strategy has to provide insights into the future industry. In the case of an incumbent telecom operator entering a foreign country, the analysis needs to deliver an understanding of the industry structure and its participants. Based on this knowledge, it is possible for the incumbent telecom operator to define an entry position with a business model that has some competitive advantages over other industry participants.

Key force in the local environment

The classic business model of a telecom operator is a vertically integrated model, from owning the infrastructure to packaging the service. The global trend towards deregulation of telecom services would enable a telecom operator to map its value chain in all primary activities to a foreign county.

However, the discussion of the economics in telecommunications regulation and natural monopolies (c.f.2) has already provided enough insights in order to make clear decisions. The activities related to infrastructure provisioning should be carefully investigated to avoid high sunk investments where interconnection regulation could provide the necessary access. The success of international strategy will be based on creating a business model that is suitable for the future industry organisation and for leveraging the globalisation drivers.
The future industry organisation is the topic of this chapter, while the implication for international corporate strategy is discussed in the next chapter.

5.3.1 Multimedia driving forces

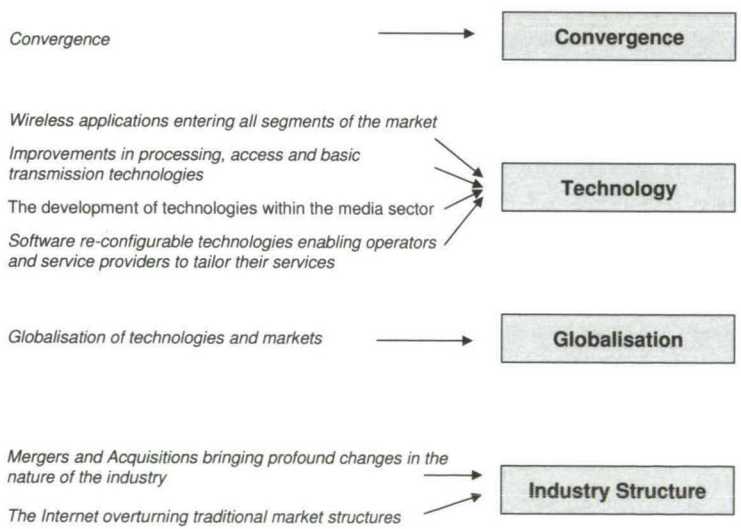
This subsection is based on the analysis in Part I. The major emphasis is placed on the known facts and uncertainties regarding the future industry structure. Each trend is sketched with its relevance to the industry development.

Deregulation (c.f.1. and 2.) was the enabler for development from the national telecom industry towards the global multimedia industry. The deregulation process concentrated on the non-contestable areas by creating a new regulation whose purpose it was to introduce competition to the market.

The regulation of interconnection is an example in which the barriers to entry for infrastructure provisioning in the international telecom market are reduced. However, the directives and agreements did not explicitly consider any future industry organisation. Although the deregulation process is the enabler for the driving forces, it is itself not considered a driver in the scenario development.

The figure below recalls the four major drivers from chapter 3.

Figure 42: Industry trends



- **Convergence** (c.f. 3.2) is driving change in the scope of the individual horizontal levels within the telecom value chain towards the new multimedia value chain. From a technical perspective, we can already see convergence

happening. However, it is uncertain how convergence will take place on the industry and market level. A portion of the converging industries are positioned along their national vertical value chain (telecom, media), while others are globally and horizontally focused (IT). It is currently unknown if dominance in the multimedia industry will be based on horizontal or vertical business models.

- **Technology** (c.f.3.3) is another important driver that is influencing and supporting change through individual developments on all levels of the value chain. Wireless services enable globalisation. Software re-configurable technologies can be leveraged through economies of scale on the horizontal level. Media technologies lead to digitalisation, convergence, and globalisation. Technological improvements are often the key criteria for acceptance or failure of a certain technology. Therefore, they form one of the decision criteria for certain industry developments to happen. Acceptance will often be based on network externalities (c.f. 2.3.2.1) rather than superior technologies.

- **Globalisation** (c.f. 3.4) has a two-fold aspect in industry development. Viewed internally, it is an enabler to leverage economies of scale. Viewed externally, it is a necessity in order to sell multimedia services with international activities at all levels of the value chain. The uncertain point is how multimedia service providers can create sustainable business models that fulfill the internal and external perspective, for example, to which degree the value chain can be sourced from which type of business partner. The scenarios of industry structure will provide some insights into how potential business models could look like.

- **Industry structure** (c.f. 3.5) is changing through the influence of mergers, acquisitions, and the Internet. These three drivers, combined with social developments, create a general change in the industry structure that is described by the two scenarios "small companies, large networks" and "virtual countries". These two scenarios are relevant to the development of the multimedia industry.

5.3.2 Application of the extended impact/uncertainty matrix

The driving forces now need to be analysed in terms of their impact on the scenario logic. I will apply the extended impact/uncertainty matrix under the original strategy question. The key focus will act as a filter to determine the level of impact and uncertainty.

The impact and level of uncertainty are mapped from the perspective of a vertically integrated incumbent who wishes to extend its geographical coverage.

The positions in the matrix are defined by the degree of impact this trend will have on the future industry organisation. The second positioning criterion is the degree of uncertainty involved with this trend.

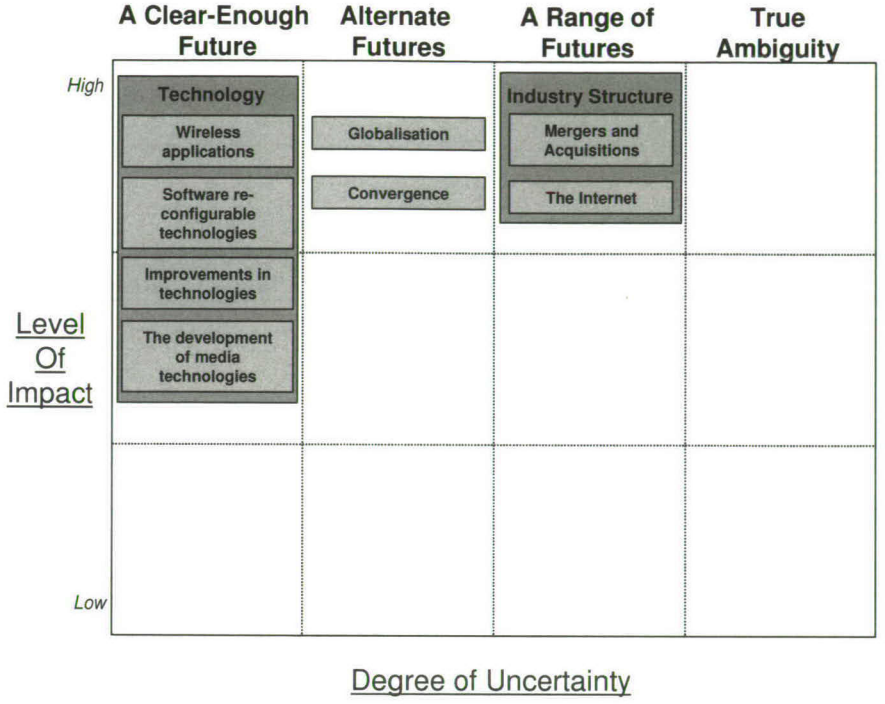
Positioning the trends is a questionable and intuitive process. In this positioning exercise, the absolute positioning will give some indication of how to handle the trend in the scenario planning exercise. However, more important is the relative positioning to the other trends.

The trends with the highest impact and uncertainty should be the focus areas for the scenario development, whereas the residual trends will serve in defined scenarios for a stronger description of the environment. To achieve a broader industry consensus, I involved industry experts from incumbents, new entrants, and horizontally oriented terminal vendors. The following three sources influenced the final positioning:

- Interviews with several industry experts form Nokia, Colt Telecom, Viag Intercom, and Swisscom.
- A management workshop at Swisscom with the trends identified by the management team.
- Personal experience

In the matrix on the next page, the trends are positioned on the basis of these sources. I will then justify the positioning.

Figure 43: Positioning of trends



All trends are positioned in the upper end of the matrix. An interpretation of the results shows that we already have a biased situation due to the selection process in the source of trends. None of the listed trends has a low impact. All of the listed trends have a medium to high impact on the future development of the industry.

The level of uncertainty differs for the individual trends described in chapter 3:

- Globalisation could form a range of futures, but can also be seen as a concrete option for entering one or the other country, or for choosing or acquiring a specific partner. In the managerial decision process, I see concrete options that create the uncertainty.

- Convergence - Understanding current regulation, as well as the market and industry trends towards deregulation, it seems clear that at least part of the converged value chain will be reflected in the future industry structure. The major uncertainty for participants is whether to focus on horizontal or vertical integration.

- Industry structure - The dimension for industry structure will be based on the two scenarios developed by the Sloan School of Management. The "small company, large networks" and "virtual countries mega play" scenarios provide concrete alternate futures. However, an understanding of the scenario planning approach leads to the conclusion that these two scenarios define a space by setting two extreme points. The reality could be each point within this range of futures.

- Although selected technology trends are very important, they do not present a great deal of uncertainty for the development of the multimedia industry. The uncertain, and therefore critical issues, include the design of the companies in the uncertain industry structure under the pressure of globalisation and convergence. However, there are several technology trends with a high degree of uncertainty, but a low impact on the industry. One example in which large companies placed big bets on uncertain technologies was the satellite telephone system "Iridium".

Following Ian Wilson's systematic approach, I can group the above trends in two areas.

High-Impact/Low-Uncertainty Trends - This is the technology-oriented group. Regarding the industry structure, I argue that technology does not present enormous uncertainties in the foreseeable future. Sophisticated strategy work from Christensen (Christensen 1997), Moore (Moore 1999), and others supports the strategy process in dealing with the trends. The evolutionary part of technology changes can be handled on the level of business strategy, which is beyond the scope of this book. However, it seems important to understand the ongoing technology changes and to integrate the trends into the scenarios in order to provide the interface for communication and the following strategy work.

High-Impact/High-Uncertainty Trends - The trends reshaping the industry and placing high uncertainty on current and future players are:

- Globalisation
- Convergence
- Industry structure

This reduction of originally almost fifty trends down to three trends helps to focus attention on the strategy question; however, it still does not answer the question.

In the next section, I will develop the scenario logic based on the three trends.

5.3.3 Selecting scenario logic

In the methodology section, I described the selection of the scenario logic as an intuitive process with the goal of finding the most stable and plausible results. The outcome provided here is the result of an uncounted number of tries. To reach this stage, I have tried several variations in the combination of the axis and have discussed the outcome with industry experts in Switzerland, Germany, and Austria. The picture changed several times during the writing of this book.

In the first trials, I placed the trends directly on the axis. However, in all combinations, I could not determine the two opposite directions for the trends convergence, globalisation, or some of the technology trends justifying a dimension in the scenario logic. However, the trials provided some evidence for the positioning of the trends in the impact uncertainty matrix. Finding a plausible dimension in the scenario logic would not justify a level 1 or 2 uncertainty (c.f.5.1.).

After it became clear that the industry structure places the highest degree of uncertainty on future development, I tried combining industry structure with a combination of individual trends. But still, the end-stages could not provide plausible industry end-stages.

The final result evolved from the uncertainties in the trend "industry structure" and the uncertain aspects in the trends "globalisation" and "convergence". Positioning these trends as important scenario drivers prompted further investigation into the underlying uncertainties of convergence and globalisation. For both trends, it is unclear how the industry will be structured in the end-state. Globalisation, as well as convergence, influence the horizontal layers of the value chain, albeit with different dynamics.

As a result, I could define two major uncertainties leading into different directions and influencing the evolution of the industry structure for the scenario logic:

1. Will the industry structure dominated by virtual countries or the large networks of comparable small companies?
2. Will the horizontal- or the vertical integration model, following deregulation, dominate the future industry organisation?

Scenario planning provides an excellent tool to map these two uncertainties and develop industry pictures for the emerging multimedia industry. In figure 44 I have plotted these two uncertainties as an axis in the diagram. The diagram spans all combinations and the entire scale of the future industry structure. Each point defines an industry structure which is characterised by the scale of integration and the size and relationship between companies.

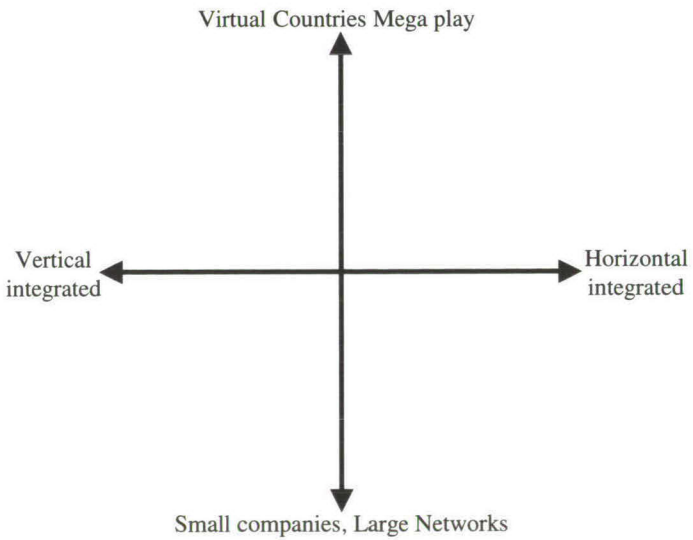
The x-axis represents the uncertainty in terms of vertical or horizontal industry organisation.

- Vertically integrated is the integrated value chain from the content to the infrastructure and service elements to the customer sales point within one corporation. From the current industry perspective, this would mean an extension of the already vertically integrated value chains of the telecom operator, cable TV, ISP's, and Electronic Publisher (c.f.3.2).
- A horizontal industry organisation is the current structure in the IT hardware, software, and service industry. The industry participants are globally focused corporations in a horizontal industry structure.

The y-axis shows the two industry extremes of virtual countries and networked industries. The crossing with the y-axis represents a mixture of vertical and horizontal integration. The position can serve as an in-between situation for getting from one position to the other, as well as to a final stage.

The version presented in this section has been stable and plausible during several discussions with industry experts. It provides useful insights into the corporate strategy process, as we will see in the following chapters.

Figure 44: Scenario logic of the multimedia industry organisation



5.3.4 Multimedia scenarios

From a graphical perspective, the scenario logic of the multimedia industry organisation provides end-stages along the boundaries of the covered space. But not all positions seem plausible as characteristics of the future industry organisation. Following Peter Schwartz's argumentation, the scenario logic is one of the basic elements for fleshing out the industry scenarios.

> *"The logic of a given scenario will be characterized by its location in the matrix of most significant scenario drivers....The scenario will usually want to be extended beyond such simple logics to encompass, for example, more subtle issues like the evolution of consumer markets or (automotive) regulation. Thus the resulting scenarios may find their core of logic less in the variations of the cells in a matrix and more in the themes and plots of a story." (Schwartz 1996:244)*

To define the scenarios, I moved along the boundaries and questioned what the different positions imply at the end-state. This process is highly empirical, but still contains a clear logic for excluding or including specific positions.

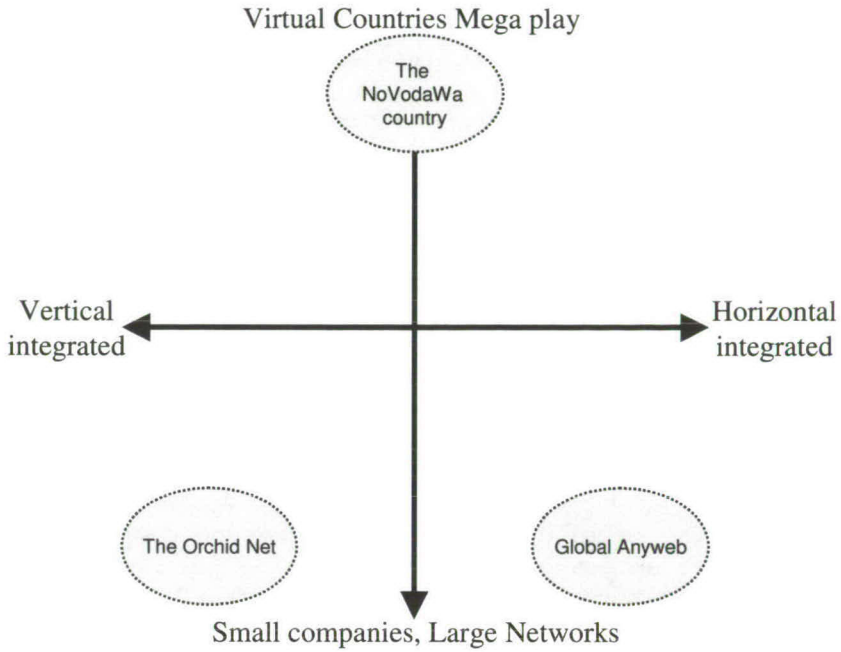
I excluded the scenario of a virtual country being horizontally or vertically focused by assuming a virtual country has to be both. In the same way, it is hard to imagine a small company operating in a network and at the same time, being vertically and horizontally integrated along the multimedia value chain. Both of these positions would be valid from the graphical perspective, but could be excluded through industry logic.

After several trials and discussions with industry experts, three positions were made plausible. A plausible position in these industry scenarios means that the industry can be imagined to be dominated by multimedia corporations with the specified characteristics.
The scenarios are mapped in the scenario logic in the graph below and explained in the following section.

The final three scenarios are presented in figure 45. I have named them by characterising their positions in the scenario logic:

- The NoVodaWa Country - The merger of *No*kia, *Voda*fone, and *Wa*rner as a virtual country that is vertically and horizontally integrated
- The Global Anyweb – A networked industry integrated through small companies that provide their horizontal activities on a global scale
- The Orchid Net – Specialised, small companies that are vertically integrated to meet specific customer needs and are networked for convergence activities.

Figure 45: The multimedia industry organisation scenarios



On the following pages, I will present the storyline for each of the three sketched scenarios. I will refer to the advice to use creativity and write the story of how the future of the individual scenarios will look in 2010 (Ringland 1998). By then, the drivers will have influenced industry development and the underlying assumption is made that the economic and political system will not have fundamentally changed.

5.3.4.1 Multimedia scenario 1: The NoVodaWa and ETeBe countries

NoVodaWa is the biggest corporation worldwide and the first truly integrated global multimedia "country". It controls the majority of consumer information, entertainment, terminal equipment, and technologies in the global market.

The NoVodaWa country was created in 2007 through a merger of the market leader in converged terminal equipment Nokia, the super content supplier AOL/Warner, and the global mobile operator Vodafone.

EteBe is the direct competitor, which was created in the same year through the merger of Ericsson, Telekom, and Bertelsmann.

In 2007, Vodafone had established a global wireless network substituting most of the fixed networks. Wireless technologies had developed further to meet most consumer needs. A joint venture with Nokia in 2005 had already set the proprietary standards in communications to secure commercial functionality with full entertainment capabilities.

The development towards the NoVodaWa and EteBe countries began in 2000, when ongoing merger and acquisition activities reached a new peak with the acquisition of Mannesmann by Vodafone and the Merger of AOL and Time Warner.

The acquisition of Mannesmann for 205 billion euros created "Europe's largest publicly traded company and the world's largest telecom group" (Financial Times 2000). With the depression in 2003 and 2004, acquisition targets were relatively cheap and enabled investment in wireless companies on a global scale. The turnaround in the global economy in 2005 spurred the growth and profitability of NoVodaWa and EteBe.

The main activities of the value net, vertically and horizontally, including infrastructure provisioning, are an integral part and core competencies of these companies. The companies control the key elements, where economies of scale can be achieved globally and a focus on customer contact is a key success factor. Local activities, not belonging to the company, are handled with franchise models in which the interface is clearly defined. Due to the size of the corporation, individual activities form profit centers. The management of the corporation controls the flow between the profit centers, the franchising contracts, and the ongoing merger and acquisition integration.

A huge portion of the profits are reinvested in social employee programs as well asthe virtual university to promote education and create wealth on a global scale. The development of instant automatic translation machines support the communication and e-learning applications.

5.3.4.2 Multimedia scenario 2: Global Anyweb

The Global Anyweb developed with full deregulation and heavy competition on the market. Original value chains were deconstructed. Each activity of the multimedia industry could form an individual industry connected through an efficient system for transactions with neighbouring activities. The vertically integrated former monopoly operators split part of their activities through independent IPO´s. New entrants came in on the horizontal level.

The development of the Global Anyweb started in 1998. The first development took place through the Internet with Internet service providers (ISP´s) changing communication, information, and entertainment patterns. At that time, ISP´s were integrated companies that owned infrastructure, switching equipment, and services. In 2005, these were different markets, each with its specific drivers, but dynamically interlinked to serve as networks with different customer profiles.

The theories of network externalities increase the value of the Global Anyweb. The Global Anyweb is part of a "distributive network" (Tapscott 2000:28). A new breed, the infomediaries, will add value for the customer and earn part of the profit. Their core competencies lie in putting the activities of the different small companies together with their software applications and delivering the network interface to the customer. The infomediaries exist for different customer profiles from age specific, gender, hobby, to professional needs.

Competition is heavy in network industries as a result of the focus on individual activities and the ability to integrate one individual core competence into a network. However, the network approach will also enable individual suppliers to find new niche positions if they can develop strong unique selling propositions. The winners are the companies who focused early on single activities and drove them towards a global market lead.

The incumbent telecom operators used to be zone concentrated, where the zone was defined by national borders. Telecom operators developed towards holding companies who invested and divested at all levels of the multimedia chain. They still earn a substantial part of their revenues by operating infrastructure as one of the core competencies in the Global Anyweb. However, a new source of revenue is the administration of the Gobal Anyweb with secure transaction handling and multicast information server.

5.3.4.3 Multimedia scenario 3: The Orchid Net

Orchid Nets were created as specialised networks targeting minorities with specific needs. The first Orchid Net was a network for botanists who conducted global research in jungle areas, where bandwidth, batteries, and reach ability were restricted. The networks developed specialised applications and delivered them vertically integrated to a specific target group.

The Orchid Net developed out of incorrect assumptions about industry developments. Business networks developed around specific industries and forced multimedia suppliers to support specific demands. Major examples are an integrated automotive and financial network. The early development of applications took place in the software business under the term supply chain integration.

Specific customer segment requirements could not be fulfilled by "virtual countries" or "horizontal networks".

As result of this period of homogenisation and standardisation in style and technology, a huge new wave of differentiation dominated consumer behaviour.

The winning industry participants are the ones who focus early on specific customer segments and support them, sometimes with partners on a global scale.

However, experience has shown that several of these specialised attempts have been overcome by new developed standards or a wider acceptance of the technology.

The best example for this is the Internet, initially developed for the military as a defence network; and then applied by academics for several years before it became a household standard. As soon as it reaches a "critical mass", the large companies enter the field and it is hard to maintain a long-term sustainable position.

This leads to the assumption that Orchid Nets are an intermediate step in the long-term development that exceeds the time horizon of this scenario.

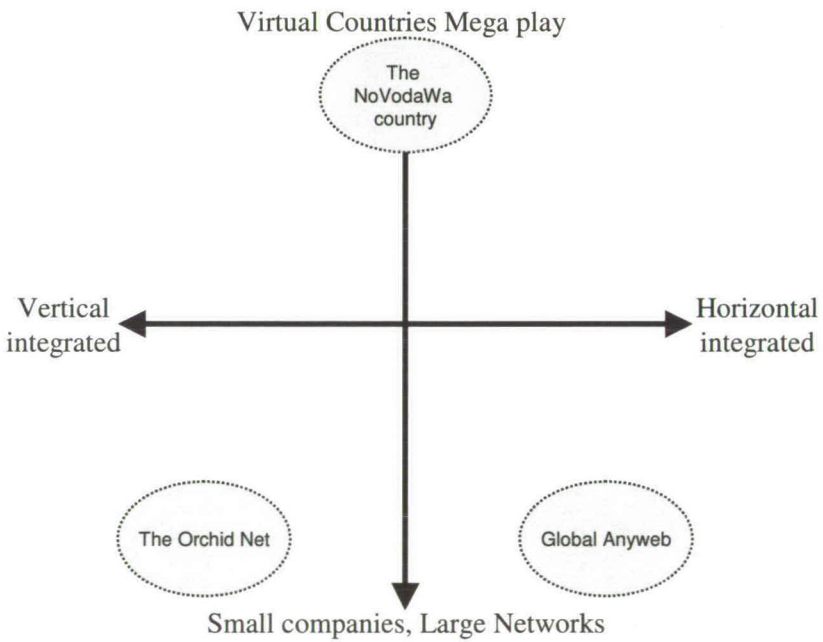
5.4 Conclusion – Multimedia industry organisation

The multimedia industry organisation brought several uncertainties into the strategy process. These uncertainties are addressed applying scenario planning as an analytical tool. The developed scenario logic is based on two major uncertainties, namely:

- Will the future of the industry be vertically or horizontally organised?
- Will virtual countries or networks of small companies dominate?

Within the defined space of potential industry structures, I could define three plausible end-states. Each end-state forms a scenario which describes the future quite differently as required in the scenario planning methodology. The figure below shows the scenario logic based on the uncertainties and the positioning of the scenarios.

Figure 46: The multimedia industry organisation scenarios

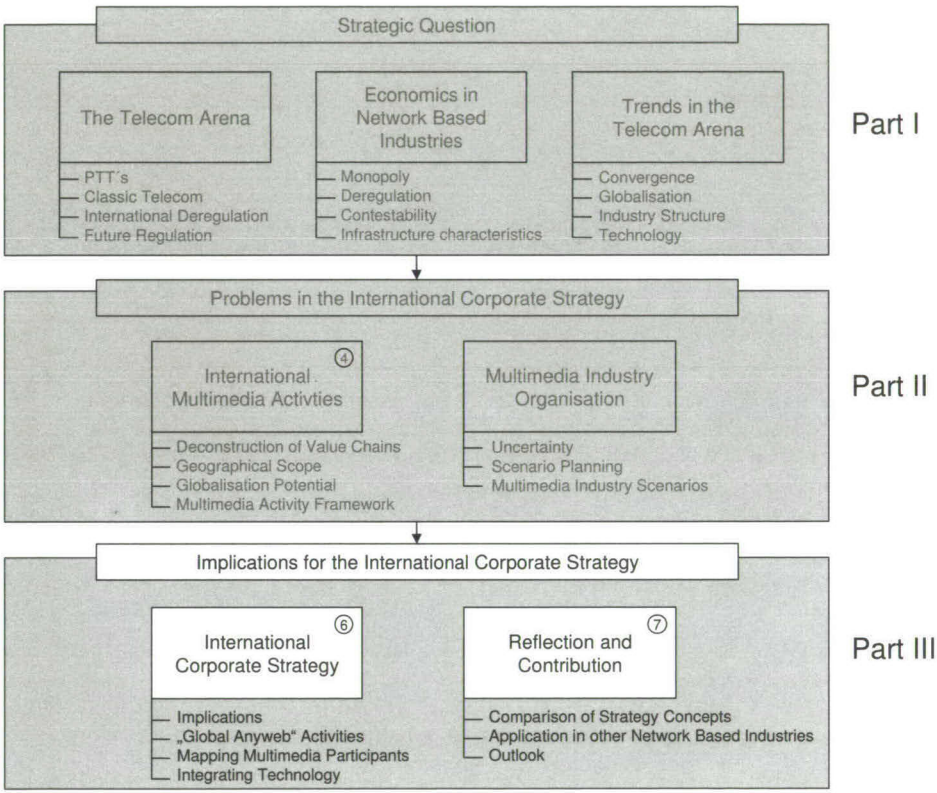


The end-states describe industry structures dominated by organisations who have a different degree of integration as well as a different size and cooperation.

- The NoVodaWa Country - The merger of *No*kia, *Voda*fone and *Wa*rner as a virtual country that is vertically and horizontally integrated
- The Global Anyweb – A networked industry integrated though small companies providing their horizontal activities on a global scale
- The Orchid Net – Specialised small companies vertically integrated for specific customer needs and networked for convergence activities.

Each of the scenarios could characterise the future industry structure. I will show the usability of the scenarios for the strategy process in Part III.

Part III: Implications for the International Corporate Strategy



6 International Corporate Strategy in the Emerging Multimedia Industry

The multimedia activity framework and the industry scenarios are designed to support the international corporate strategy process. Up to this point these two elements have been developed fairly independently of each other based upon the industry analysis in Part I. The combination of these elements creates a basis to assist strategists in the emerging multimedia industry. In this chapter, I will show how the two elements, namely the multimedia activity framework and the industry scenarios, fit together and serve as an integrated tool in the strategy process.

The analysis thus far has focused on future industry development. At this point, I will change the focus from the industry perspective to the implications for individual corporations.

Following the scenario planning process, this chapter will cover the steps "implications" and "selection of leading indicators and signposts" (c.f.5.2.1).

- First, I will show which implications the scenarios have for corporate strategy by providing a detailed example and showing how the scenarios and the activity framework support the strategy process. I will then look at the implications of the scenarios for different industry participants by examining the implications and resulting strategic options of the three scenarios "NoVodaWa Country", "Global Anyweb" and "Orchid Net" for different types of multimedia participants.
- Secondly, I will discuss the multimedia industry evolution towards the end stage of the scenario logic, and will show how the future perspective can be used in today's decision process.

Furthermore, I will present how the industry analysis conducted under the uncertainties of deregulation, convergence, globalisation, industry, and technology changes can be integrated in the corporate strategy process.

However, the primary value should be seen in the future perspective. The understanding of potential industry developments improves internal communication and allows corporate management to adapt more quickly to industry changes.

6.1 Implications of the scenarios for the corporate strategy

The three scenarios "Global Anyweb", "NoVodaWa Country" and "Orchid Net" are "fleshed out" in chapter 5. To proceed in the scenario planning methodology, Peter Schwartz recommends looking at the implications of the developed scenarios for the specific corporation.

> *"Once the scenarios have been developed in some detail, then it is time to return to the focal issue or decision identified in step one to rehearse the future." (Schwartz 1996:246)*

The scenarios, as well as the activity framework, were designed to define international corporate strategy from the telecom operator's perspective. One of the important issues is now to understand what I have gained in developing the scenarios and how they can be used in the corporate strategy process.

Up until now, the scenarios have been a fairly abstract description of potential future industry structures. To benefit the managerial level, the current stage needs to be developed to a level where managerial actions can be projected. The multimedia activity framework helps to make the scenarios more concrete and to discuss possible international strategies based upon the developed scenarios.

Before I present the concrete scenarios and their implications, the multimedia participants that will be affected need to be defined. The definition of the multimedia industry as the converged industry of telecom operators, IT companies, content providers, and others, has shown that there is currently no homogeneous profile of a future multimedia company.

However, I am able to distinguish significant differences between corporations entering this field by looking at their core competencies and scope. The implications of the scenarios are different depending upon the current position of the corporation.

For the application of the industry scenarios as they relate to the strategic question, I will look at three types of participants and discuss the implications of the scenarios based on these types. This grouping is based on the different relevance of the scenario implications, which creates the opportunity to intensify the argumentation with the following examples:

1. Small/medium telecom operators – Small/medium telecom operators dominate their home market. Their size in comparison to the global or European market is small. (c.f.1.2.1) Examples in Europe include the incumbent telecom operators from Liechtenstein, Luxemburg, Belgium, Switzerland, Netherlands, Austria, and Sweden.

2. Large telecom operators - Large telecom operators dominate their home market, but due to their size, have obtained a significant market share in the European or global market. Examples include British Telecom, France Telecom, and Deutsche Telekom. Historically, a large telecom operator has the same core competencies as a small telecom operator. The only major difference is the scale of the operator's activities and the financial power behind changes in the operator's corporate strategy.
3. Other multimedia participants - Other multimedia participants can have various forms and play important roles in the future multimedia industry. I have chosen this category to focus on the first two categories and to point to some interesting strategic positions.

The definition of the classic telecom operator (c.f.1.2) is the same, independent of the operator's size. Therefore, some of the arguments for large and small/medium telecom operators are similar. However, there are some areas in which the strategic position and ability to act vary depending upon the operator's size. In the following chapters, I will show the degree of impact that size and current position have upon international corporate strategy by applying the developed tools.

6.2 Small/medium telecom operator in the "Global Anyweb" scenario

The "Global Anyweb" scenario presents the industry as a network of international activities. Each activity can be viewed as an individual business. The "Global Anyweb" is the preferred scenario of small and medium telecom operators. The network of corporations is an industry organisation that leaves enough space for small operators to focus on individual positions. A classic small/ medium telecom operator is active in several of the activities, but is restricted to its national territory.

Looking at the future industry, I assume that markets will function perfectly between the individual activities. As long as there are imperfect or non-existent markets for individual activities, the telecom operator can either create that market or wait until it is developed. Over the last decade, there have been several industry examples of a change from the vertically oriented market to horizontal industry organisations and networked industries, including:

- The current telecom industry can be compared with the computer industry twenty years ago. The same vertical integration took place in the computer industry, and then changed drastically to a horizontally integrated industry (Seaberg 1997). IBM, Wang, and Digital Equipment used to be fully integrated, from hardware production, selling the operating system, to the application of software and services. These integrated companies no longer exist. The industry is now made up of global players that are focused on specific hardware, operating systems, and networks and application.
- The restructuring of the telecom industry in the United Kingdom, which was the first European country in which deregulation took place, led to the emergence of new focused providers, like Vodafone, who put strong pressure on the individual activities of the incumbent British Telecom (BT).

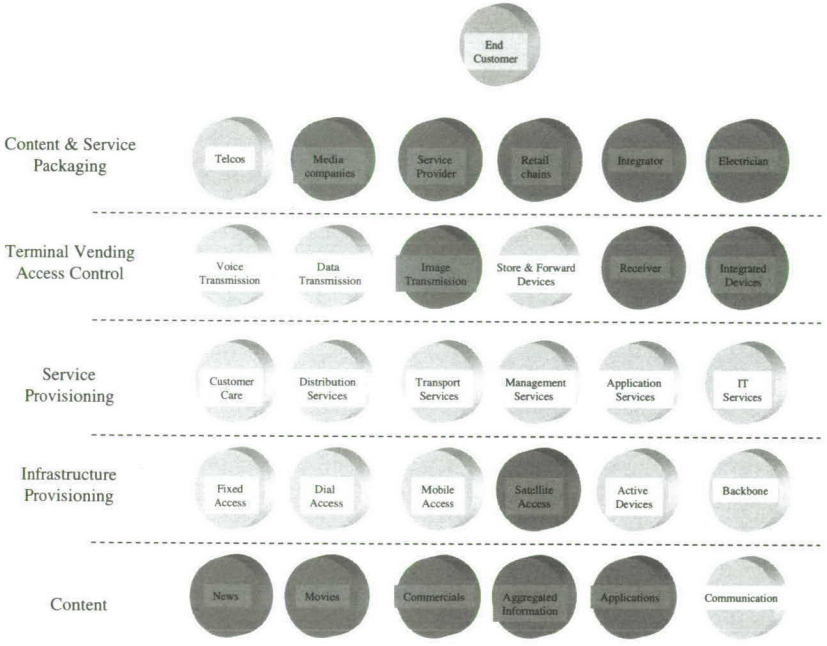
Similar developments have occurred in other network-based deregulated industries, such as utilities, transportation, and banking. In all examples, a shift from a broad, vertically integrated industry structure towards a focused, horizontally oriented structure has taken place. The shift from a truly vertical industry to a highly competitive horizontal industry has also created a shift from dominant, vertically integrated industry players towards new entrants on the horizontal levels.

Within the multimedia activity framework, all activities necessary to meet the demand of a specific end-customer would be connected as one virtual business. Therefore, vertically integrated telecom operators have to rethink their core activities and start to develop their network. The small/medium telecom operator has to position itself for international expansion based on the globalisation potential of its core competencies.

6.2.1 Positioning in the multimedia activity framework

The first step in the strategy process is the positioning of the current business in the activity framework. The activities in the framework are the future converged and global activities, in contrast to the current national telecom activities. Therefore, the positioning in the framework implies the need for change towards the future character of the activities. The figure below highlights the current activities of a classic telecom operator.

Figure 47: Position a classic telecom operator in the multimedia activity framework



On the horizontal layers, telecom operators cover several different positions, for example:

- Content & service packaging, which was traditionally a functionality fulfilled by the telecom with the direct end-customer interface.

- Terminal vending/access control – The access control was originally an activity that telecom operators controlled by licensing, selling, and maintaining terminals from several vendors. Few telecom operators currently produce terminals. The role of telecom operators in terminal equipment has diminished over the last years, following deregulation of terminal equipment. However, telecom operators are still active in reselling and operating terminal equipment.
- Service provisioning – All areas of service provisioning have been traditionally provided by the telecom operator, which tie together its vertically integrated value chain from the infrastructure level to customer service.
- Infrastructure provisioning – This is one of the former core competencies and the reason for a "natural monopoly" in all areas related to fixed and mobile telephony and data transfer. Satellite access can be part of the telecom activities, but is handled differently in each country.
- Content provisioning – This is not a core competence of a telecom operator. In this context, I specify communication as content, whereas telecom operators provide the ability to transfer and store voice and data as information.

The currently integrated value chain has to be internally deconstructed (c.f.4.5). Each activity is seen as an individual business interacting with the other activities. On the corporate level, this implies creating a set of business units or a holding of several small companies that would map the added value activities of a telecom operator in the activity system.

To shape international market development, or at least actively participate in international market development, a telecom operator will integrate his activities into the emerging networks. This strategy follows the globalisation potential of the individual activities. When I look at the implications for a small/medium telecom operator under the "Global Anyweb" scenario, I see three types of activities that require different strategic actions, namely:

1. Activities with high globalisation potential
2. Activities with a high need for national differentiation
3. Activities not covered today in the telecom value chain

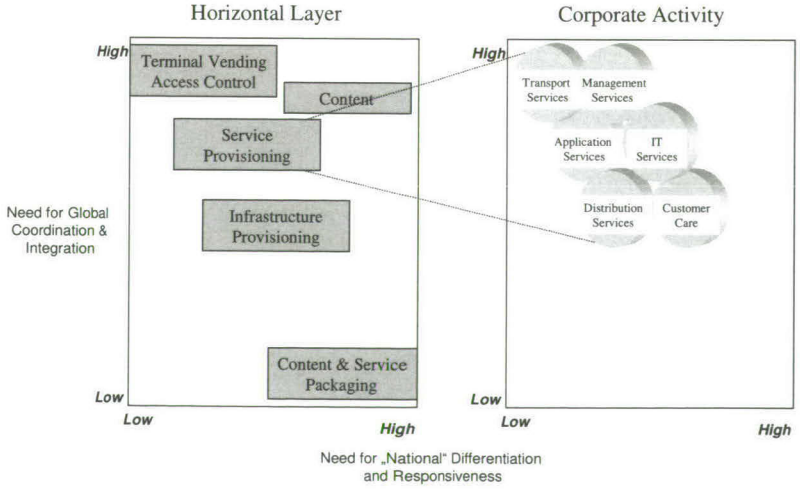
The following subsections will describe the strategic implications for the globalisation potential of each of the above three activities.

6.2.2 Activities with high globalisation potential

The activities with a high globalisation potential are the focal point of international strategy. For an example, I recall the anatomy of the transnational operator for service provisioning (c.f. 5.4.1.4). The analysis has shown that service provisioning can have enormous economies of scale, as global customers have a high demand for global services. The trend towards globalisation is supported by the growing applications of software re-configurable technologies (c.f.3.5.4). I assume that market economics will drive industry evolution, and activities like service provisioning are expected to be global with centralised operations.

A telecom operator covers all service provisioning activities in its vertically integrated value chain, and provides these services as a service to its customers. The new approach is to look at each activity as an individual business with possible extensions of the scope, be it nationally or internationally. Typical examples today include call centre or billing services. Telecom operators perform these activities on a large scale internationally; therefore, they should consider diversifying in these activities and creating an individual business. The current task of the small/medium telecom operator is to look at each service activity individually. The business strategy for the individual activity, based on the globalisation potential, will provide the operator with input for further corporate decisions.
The corporate task in implementing the strategy is to allocate the resources within the holding based on the options with the highest potential return.

Figure 48: Activities with high globalisation potential – Service provisioning



6.2.3 Activities with high national differentiation needs

Activities with a high need for national differentiation must be treated differently than activities with a high globalisation potential in the Global Anyweb scenario. The typical example from a telecom perspective is the local loop as part of infrastructure provisioning. The specifics of this type of activity have already been discussed under the topic of interconnection (c.f 2.3.3) and the potential of infrastructure provisioning (c.f.4.4.1.5).

To describe an activity with high national differentiation needs, I focus on another activity in which the change in the industry affects the telecom operator even more than the example of the local loop.

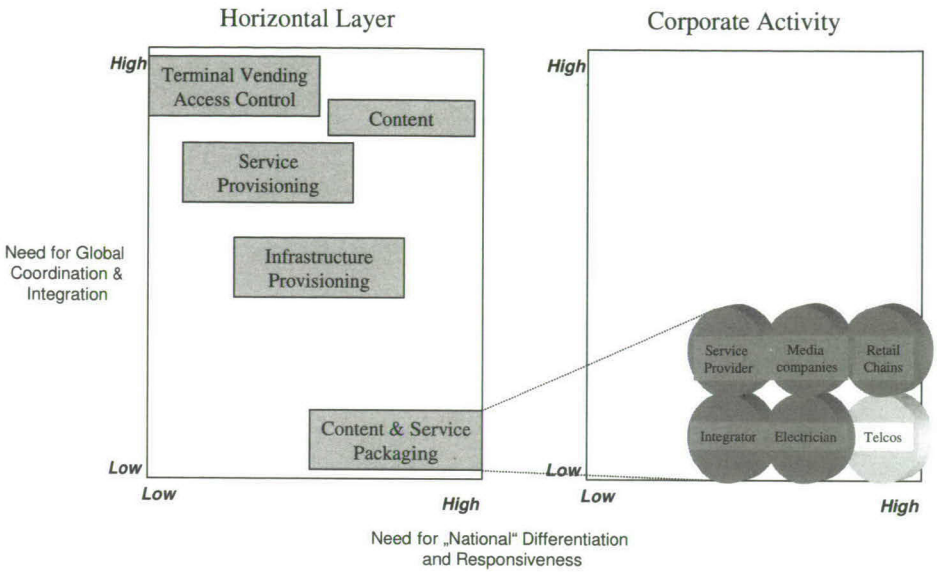
I recall the anatomy of the transnational operator for content and service packaging (c.f.5.4.1.3). Classic telecom operators used to package and sell their service through their own sales force to all nationally based customer segments. Since they held a monopoly position, it was not crucial to be efficient or customer-oriented.

Content and service packaging is an activity in which competition is playing an important role early in the game. On a national basis, the strategic role of the incumbent is to defend its position and consider possible solutions through its cooperation with national retailers or international service providers. Based upon the current development, retail shops, supermarkets, and specialised service providers are entering the field of content and service packaging.

Regarding international strategy, I again assume perfect market conditions with low transaction costs between the individual activities. The small/medium telecom operator does not have a strong position in foreign markets, as it is not familiar with the local business and has no customers which can be leveraged.

As a result, the small/medium telecom operator should find partners in the Global Anyweb scenario with good customer contacts in the countries in which the telecom operator wishes to sell its services.

Figure 49: Activities with high national differentiation needs – content & service packaging



6.2.4 Activities out of the current telecom operator scope

The activity framework contains several areas that are currently out of scope for an incumbent telecom operator. The activities can be combined in the Global Anyweb scenario with current telecom activities through partnering or acquisition strategies.

Content provisioning is one of these areas. For example, global news agencies and local reporters produce the news, and movies are produced by specialised movie producers and sold worldwide. The activities "out of the current telecom operator's scope" create both opportunities and threats for the telecom operator.

The classic telecom operator does not produce any content. However, packaging and transporting all kinds of content over different infrastructure types is one of its core competencies, as a telecom operator can integrate content into a converged multimedia service offering. Therefore, international strategic opportunities include the possibility to partner with a provider of content.

Under the Global Anyweb scenario, a telecom operator should define its target geographical coverage and the kind of content it wishes to deliver with the similar characteristics. The different types of content provide a telecom operator with the opportunity to create a unique position for each market:

- One example could be the connection of banking zones in Europe integrated with specific content provided from Reuters and the different stock exchanges.

- Another example is the "call me" button on internet pages. The web service is combined with a call centre and the content for the page.

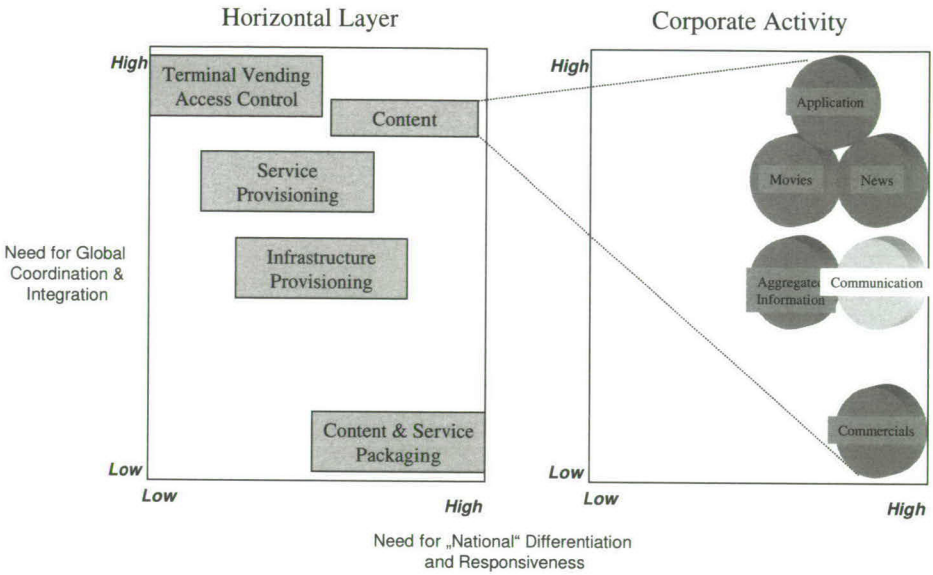
The integration can be accomplished by diversifying into the content field through mergers and acquisitions, or by joining forces with a complementary content provider. In both cases, the telecom operator should assume the role of the infomediary controlling the network and maintaining the customer base. A competitive advantage is gained by being early in the design of the network.

There are a few cases in which diversification will occur internationally in the first step. In some instances, the foreign market can serve as a test market before a roll-out in the incumbent's home market is started. One of the examples for this is the Debitel unit of Swisscom, in which service provider capabilities could first be tested in Germany. The experience that Swisscom has gained can benefit its mobile unit in the distribution of its products in the home market and other international markets.

Threats may arise when content providers extend their scope and enter the field of telecommunication operators. This is currently the case with media companies who

own the cable-TV-infrastructure and offer "set-top boxes". With this new type of terminal equipment, the content provider can offer internet access and telephony, thereby competing directly with the telecom operator.

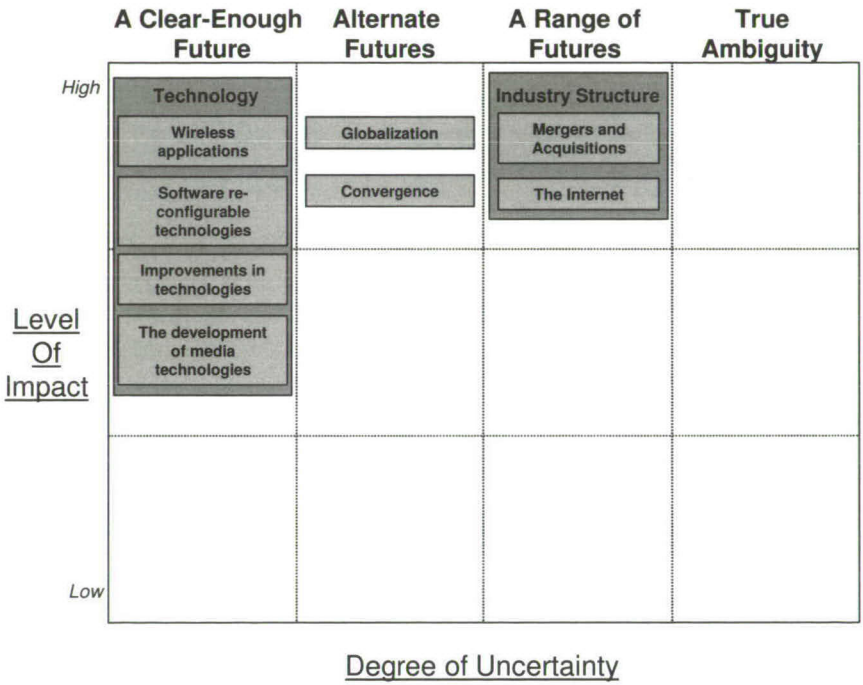
Figure 50: Activities out of the current telecom operators scope – content



6.2.5 Integrating the technology trends in the corporate strategy

So far, the discussion of international corporate strategy has been primarily based on uncertainties and resulting scenarios. Following the scenario planning methodology, I focused first on the uncertainties driving the scenario logic. However, in the industry analysis, I selected several trends that were not integrated as critical scenario drivers in the development of the scenario logic. The trends were all positioned in the column "A Clear enough Future" (please see the figure below). The question that now remains is what happens to these trends in the corporate strategy process when using scenario planning as the methodology.

Figure 51: Positioning of trends



Independent of the scenario chosen or the strategy defined, technology trends have a high impact on industry development. The scenario planning methodology refers to these trends as "critical planning issues" (c.f.5.2.2).The "clear enough future" enables the corporation to include technology trends in its current planning process, as technology is often the enabler or decision criteria for industry development in a particular direction.

The picture designed for the interaction of the activity framework and the scenarios in the future multimedia industry can be completed with the integration of technology trends. A discussion of the impact of the Global Anyweb scenario on the different activities of a small/medium telecom operator shows how the impact of globalisation is different for each activity. The same methodology can be used in the planning process for technology trends. The impact of new technologies can be tested on the current value chain for the current planning process as well as on the future activity system of the multimedia industry in order to define corporate strategy.

- Wireless applications currently have a strong impact on current terminal vending and future content creation.
- Software reconfigurable technologies have an impact on current service provisioning and enable interesting business positions under the "Global Anyweb" scenario (c.f.7.2.2).
- Improvements in technologies need to be implemented in the current network and will change the terminals under the activity terminal vending.
- The development of media technologies with the introduction of interactive TV's needs an advanced supply of TV's in private households.

Technology management is taking place at all levels within and outside the organisation, and a great deal of know-how can be found on the business level, both nationally and internationally. In the case of telecom operators, technology innovation is to a high degree influenced by the suppliers of terminals and network infrastructure.

An understanding of the future scenario, and where and to which degree the impact will take place, are important from the corporate perspective. The activity framework can serve as a basis for the discussion of how new technologies will affect the industry and to which extent the corporation should react to technological changes.

The management of technological changes within a corporation has many facets that extend the scope of this book. The successes and failures due to new technologies are discussed in various sources and from different perspectives (Christensen 1997, Cooper et. al. 1998, Kelly 2001).

Technological changes affect the corporation on all levels, that is nationally, internationally, and on a corporate, business, and functional level. The role of corporate strategy should be focused on the understanding of the effects of the chosen strategy, and should support change on the relevant business level (Campbell et.al.1995).

6.2.6 Conclusion - International strategy for the small/medium telecom operator in the "Global Anyweb" scenario

The "Global Anyweb" Scenario assumes that each activity can form a business on its own. Telecom operators are active in just a few areas of the multimedia activity system. Success, be it international or national, is dependent upon the telecom operator's performance in the individual activity and the evolution of the business network. Furthermore, the globalisation potential for each activity is significantly different (c.f.5.4).

Internationalisation should take place for activities for which the telecom operator already has a core competence and where globalisation potential provides the logic for the business case. In the case of a small/medium incumbent telecom operator, is the highest potential is on the horizontal layers of service and infrastructure provisioning. In contrast, the limited globalisation potential in content and service packaging demands the development of a sufficient retail channel. This can be achieved either through a focused approach selling direct to end customers, or through sales to other multimedia participants as part of the "Global Anyweb". A telecom operator always has the opportunity to "fill a hole" by working together with other operators if its own performance in a particular activity is below market performance.

The activities with a high need for national differentiation are the ones in which the telecom operator is traditionally strong in its home country, but losing influence due to deregulation. However, the difficulties in building up these same activities in a foreign market reduce the relevance of international corporate strategy. Examples include the local loop or local customer contact. From an incumbent's perspective, these areas need to be protected and made as efficient as possible, thereby increasing the barriers to entry. In this case, an incumbent is acting against the regulator, who is striving to reduce the barriers to entry. A careful marketing approach, which also considers political issues, is necessary for an incumbent to achieve a sustainable position.

The activities that are beyond the scope of the telecom operator should be investigated to determine the partnering and diversification options. However, it is questionable if market entry in these activities should be undertaken internationally, if the telecom operator has not already established a strong international foothold based upon its core competencies.

The key for successful change within an organisation is its capability to partner on different horizontal levels. The winners in this scenario will be the corporations with the lowest transaction costs and the infomediary who is able to provide the service coverage in the activity framework that is customized for the mass population. (Christiansen and Moore)

6.3 Mapping multimedia participants with the scenarios

The example of a small/medium telecom operator in the "Global Anyweb" Scenario has shown how important the introduction of the activity level for the corporate strategy process is and how the scenarios and multimedia activity framework fit together.

In this section, I will provide an overview of how the scenarios fit for different kinds of corporations and how they can use the scenarios to consider different future paths. The scenario planning exercise generated three industry scenarios, for which I defined three types of industry participants. Assuming that it is plausible to combine each scenario to an industry participant, I end up with nine potential strategic options, which the table below summarises:

Figure 52: The strategic options

	Small Medium Telecom operator	*Large Telecom operator*	*Other Multimedia Participants*
NoVodaWa			
Global Anyweb			
The Orchid Net			

The international aspect of each scenario is considered, based upon the globalisation potential and the resulting strategies, which themselves depend upon the demand for global integration or national differentiation. The multimedia activities that are not within the current scope of the corporation need to be investigated to determine if the corporation should enter into this activity or join forces to create a strong, integrated multimedia positioning.

In this section, I will provide an overview of the individual fields and show how different the implications of a particular scenario are for individual participants.

6.3.1 Small/medium telecom operator in the NoVodaWa scenario

The NoVodaWa Country scenario assumes an industry organisation of vertically and horizontally integrated multimedia "countries". The creation of this extensive position seems out of range for a small/medium telecom operator. However, there are several options for a small/medium telecom operator if the signs are turning in the direction of the NoVodaWa Country scenario:

- Small/medium telecom operators are typically majority-owned by the national government. Public opinion has historically grown in the belief that the telecom operator is a national good. To protect this patriotism, the telecom operators need to maintain a strong position in its home market. A further development of the telecom operator's core competencies result in a company that would be more strongly integrated, thus reducing all transaction costs and focusing on efficiency. The portfolio would be reduced, with a focus on the future demand of converged services. International expansions are less important unless they help the telecom operator achieve a stronger national position. This position would create barriers to entry for a global NoVodaWa and keep the positioning of the small/medium telecom operator sustainable. However, regulation and its goal of introducing competition may hinder the small/medium telecom operator in implementing such a strategy.
- Another option for the small/medium telecom operator is to prepare for a valuable position in the NoVodaWa Country. This approach assumes that the small/medium telecom operator will eventually be part of a NoVodaWa country. To achieve this position, the operator needs to strengthen activities that are nationally oriented and develop selected activities that make the operator more attractive. This can take place through a strong financial position, material assets like buildings, networks or immaterial assets like patents, certain service developments, or a strong international customer base which can be leveraged by the big partner.
- The third option for a small/medium telecom operator are alliances to compete against the NoVodaWa´s. This theoretical option has been attempted in the airline business (Star Alliance) as well as in the telecommunications business (Unisource / Global One). The organisation of alliances seems plausible on a theoretical level. However, experience to date has shown limited success. This option, although intuitively the most effective approach, is difficult to accept on a national political level.

The resulting options for a small/medium telecom operator under the NoVodaWa scenario vary in nature. However, the value of scenario planning is to foresee that the industry could develop towards the NoVodaWa scenario and to understand the strategic options. I call the position in the matrix "decorate" for decorating the bride for the wedding in the NoVodaWa country.

6.3.2 Small/medium telecom operator in the Orchid Net scenario

The classic telecom operator is positioned for a broad national customer base and product portfolio in a national market. This is the opposite position of an industry structure in which Orchid Nets have the most significant market share. Orchid Nets target specific customers or niche technologies, and provide their services on a global basis. However, there are some options for a small/medium telecom operator in anticipating this development.

- Option 1: Assuming that the broad national customer base includes the specific target customers of the Orchid Nets, the small/medium telecom operator can act as a sales agent for Orchid Net services. Cooperation's with several Orchid Nets can extend the telecom operator's service offering and can allow the operator to benefit from dedicated developments. As a result, the telecom operator can maintain a strong position with his national customer base.
- Option 2: Within its national base, the small/medium telecom operator can sell interconnection to the Orchid Nets and benefit from the expected growth in traffic needed for applications developed by the Orchid Net. For example, these growth opportunities could include a global traffic management system, through which local mobile networks transport information.
- Option 3: The skills needed to develop telecommunication-related services can be applied in the Orchid Net's scenario. A small/medium telecom operator can either act as a service development centre or increase its attractiveness by acting as outsourcing partner that operates the telecommunication portion of the multimedia service. The traffic management example mentioned in Option 2 can be extended in operating the server and application for to collect and distribute global information.

I name the position of a small/medium telecom operator in the Orchid Net scenario "cooperate". This description demonstrates the necessity to cooperate along the activities of the value chain on a national, as well as international level.

6.3.3 Large telecom operators in the NoVodaWa scenario

Believing in the NoVodaWa scenario can be an issue for large telecom operators like AT&T, NTT, BT, and Deutsche Telekom. These large telecom operators can become giant multimedia corporations as a result of intense mergers and acquisitions. Under the NoVodaWa scenario, the already large players would need to extend their geographical and horizontal level scope with other large players. They have two different priorities:

1. Focus on the existing value chain and drive it globally through acquisitions of equal multimedia participants.
2. Extend the scope through national diversification, like a joint venture between Deutsche Telekom and AOL Bertelsman.

To achieve the envisioned end-stage of a NoVodaWa country, the large telecom operator has to take both priorities into consideration and drive the process with the same level of excellence. One of the early attempts in the NoVodaWa direction was the creation of alliances. However, this approach did not create sustainable business models, as the break-up of the three biggest global alliances for telecom services within the last four years has shown:

- Unisource, the global joint venture between Telia (Sweden), KPN (Netherlands), and Swiss PTT (now Swisscom), was in its growth stage evenly aligned with AT&T and Telefonica (Spain) to become the global telecom service provider.
- Concert, the joint venture between British Telecom and AT&T, with the same idea to merge part of the two companies.
- Global One, the joint venture between France Telecom and Deutsche Telekom, with the ultimate aim to merge the two giants, was divested from Deutsche Telekom and merged into Equant, a France Telekom subsidiary. Equant is currently one of the few real global service providers, with a focus on business customers and data and voice communication services.

The alternate solution seemed to be mergers or acquisitions between the large telecom operators. For example, AT&T and BT and France Telecom and Deutsche Telekom underwent merger talks. Afterwards, Deutsche Telekom tried to buy Telecom Italia, but lost to Olivetti. The strategy seemed fairly clear, that is, become big and purchase or merge based on the highest priorities and best opportunities. Furthermore, market conditions in 1998 favoured this approach.

However, the intense acquisition process also contains a great deal of risk, as is seen in the financial situation of France Telecom, KPN Qwest, and Deutsche Telekom. Current financial markets are discouraging growth through capital intensive acquisitions and mega mergers.

I call this position "create" for the task of being the creator of the NoVodaWa Country. Creating sustainable NoVodaWa´s with merger and acquisition strategies and value-based management is a wide field for further research, which goes beyond the purpose of this book.

6.3.4 Large telecom operator in the Global Anyweb scenario

Large telecom operators formerly had a monopoly position which allowed them to develop a specific corporate culture. The NoVodaWa scenario would be the favourable scenario, as it places telecom operators in a similar position on the global scale.

However, current market conditions provide sufficient evidence that the large telecom operator should consider the Global Anyweb scenario. Besides unstable financial markets, antitrust regulation could force industry development towards the Global Anyweb scenario and significantly reduce opportunities in the NoVodaWa scenario.

To achieve a sustainable position in the Global Anyweb scenario, large telecom operators would have to react in the same way as small/medium telecom operators. However, the major difference is the amount and size of possible diversification options due to the operator's financial power.

- A belief in the Global Anyweb scenario means the deconstruction of a national operating incumbent's value chain and a focus on specific activities, with a drive towards globalisation and convergence.
- The second role in the Global Anyweb scenario is the creation of a network with partners to provide the full converged services on a national and international basis. Using its financial power and customer base, a large telecom operator should aim for the position of an infomediary managing the network.

Two issues should be kept in mind in the organisational development of a large telecom operator, namely:

- structuring acquisitions in a way to be able to integrate the acquisition targets as partners in a Global Anyweb.
- considering the horizontal focus on globalisation activities may strengthen the future value of the corporation.

I call this position "spinning" for the task of being the infomediary of spinning and controlling the "Global Anyweb".

6.3.5 Large telecom operator in the Orchid Net scenario

The Orchid Net scenario offers the same business environment for the large telecom operator as for the small/medium telecom operator. The only difference is the size of the operator and that of the respective national economy. These two factors can create interesting new business opportunities for the development of global Orchid Nets.

The large telecom operator can focus on strong local industries. For these industries, it can develop Orchid Nets, thus combining telecommunication skills with the locally available skills in dominant industries.

An example of this scenario is the automotive industry in Germany. Deutsche Telekom could act as the infomediary building up the global supply chain for companies like Volkswagen, Daimler Chrysler, BMW, Audi and Porsche. The "Automotive Orchid Net" could deliver all information about parts and delivery status, and could serve as the marketing platform, over which all graphical information and ordering processes are handled. The infrastructure and development of the Orchid Net could be located in one country. However, the application and access to that Net could be made available on a global scale.

The complete spectrum of the multimedia value chain on a global scale creates opportunities, based on the national economies, where large telecom operator can create a unique position.

I call this position "develop", to reflect the opportunities to build a strategic, international position by developing nationally available skills.

6.3.6 Other multimedia participants in the scenario logic

The multimedia industry is defined as the converged industry of the IT, telecom, broadcasting, and publishing industries (c.f.3.2.1). "Other multimedia participants" come from industries that were deregulated earlier or were subject to monopoly regulation like the computer industry. In these industries, international corporations could develop in a much earlier phase based upon industry globalisation potential. Today, the strategic questions of the "other multimedia participants", who have global experience, concentrate more heavily on the effects of convergence than on the shift from a national corporation to international markets.

The computer industry went through the deconstruction of the value chain two decades ago. Today, there are dominant players in the individual activities. For example, corporations like Microsoft, Cisco, and Nokia position themselves on the horizontal level.

Depending on size and position, the Global Anyweb and NoVodaWa scenarios have similar strategic aspects for other multimedia participants than for large and small/medium telecom operators.

- Microsoft has made several attempts with MSN[37] and mobile devices[38] to position the corporation in a wider portion of the multimedia value chain in the Global Anyweb scenario.
- The AOL Time Warner joint venture has targeted the NoVodaWA scenario.

In all three scenarios, I see a plausible position for "other multimedia participants" within the development of the multimedia industry. The scenarios offer several interesting business opportunities. A detailed analysis would exceed the scope of this book. However, the positioning of each corporation in the emerging multimedia industry is highly dependent on its current position and future development within the industry.

The Global Anyweb and NoVodaWa scenarios and the multimedia framework have the same relevance for "other multimedia participants" as for telecom operators. I position the strategic options for "other multimedia participants" under these two scenarios as "depends".

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[37] MSN = Microsoft Network providing Internet services to consumers globally

[38] Motorola/Microsoft Alliance The Mobile Devices Division at Microsoft Corp. announced its alliance with Motorola Inc. to build and deliver a series of Microsoft Windows Mobile-based Smartphones and Pocket PCs in September 2003.

6.3.7 Other multimedia participants in the Orchid Net scenario

There are some specific cases for "other multimedia participants" in the Orchid Net scenario that create interesting business opportunities. I want to present two of the options that will complete the picture for the role of telecom operators in the Orchid Net scenario, here:

- Content providers like Reuters[39] and Datev[40], who provide dedicated information and applications to their customers, could gain an even greater role, assuming Orchid Nets evolve as one of the important business models in the multimedia industry. The creator of the content owns the most valuable asset in this Orchid Net, and has the potential to control the Orchid Net as infomediary. In this role, the creator of the content is able to integrate the value activities as a dedicated service on a global scale.
- Orchid Nets could also be developed from a content and service packager, for example, from a sailing Orchid Net. Specialised yacht companies could offer integrated packages that provide mobile communication solutions for skippers. Such an integrated sailing package could include satellite phone services, international GSM services, weather information, localised services[41], and assistance with the sailing route and harbours, as well as event information and management.

For both options, the Orchid Net would be managed by "other multimedia participants". However, telecom operators could position part of their activities in this network, as described in section 6.3.2.

The Orchid Net scenario assumes that corporations with vertically integrated value chains will succeed in the development of the multimedia industry. However, for these corporations to be successful, the driver has to be either a specific content or global customer segment that is addressed with integrated packages. I call the position for this role "integrate".

[39] Reuters is a London based news agency focused on financial information's
[40] Datev is a specialised German corporation outsourcing the tax administration. Datev is operating a computer centre to deliver tax calculations for tax consultants
[41] Localized services provide information depending on the current location of the mobile phone owner

6.3.8 Conclusion - multimedia participants in the scenario logic

This section maps the three multimedia scenarios with different multimedia participants. For each combination of a scenario and a multimedia participant, I am able to sketch strategic options based on the globalisation potential that arises from the positions in the activity framework of the multimedia industry. The table below summarises the strategic options:

Figure 53: Recommended strategic options

	Small Medium Telecom operator	*Large Telecom operator*	*Other Multimedia Participants*
NoVodaWa	Decorate	Create	Depends
Global Anyweb	Focus	Spin	Depends
The Orchid Net	Cooperate	Develop	Integrate

The table shows the implications each scenario could have and how a corporation can react to the scenario.

The description of the individual scenarios shows how the options for "other industry participants" fit to those of telecom operators under the same scenario. It also shows how the current size of a corporation can influence future potential.

Based on the strategic options, an individual corporation understands how to incorporate uncertainties in its corporate strategy process. However, these options cover only a portion of the analysed industry trends in the multimedia industry. In the next section, I will show how the trends with a clear enough future relate to the strategic options.

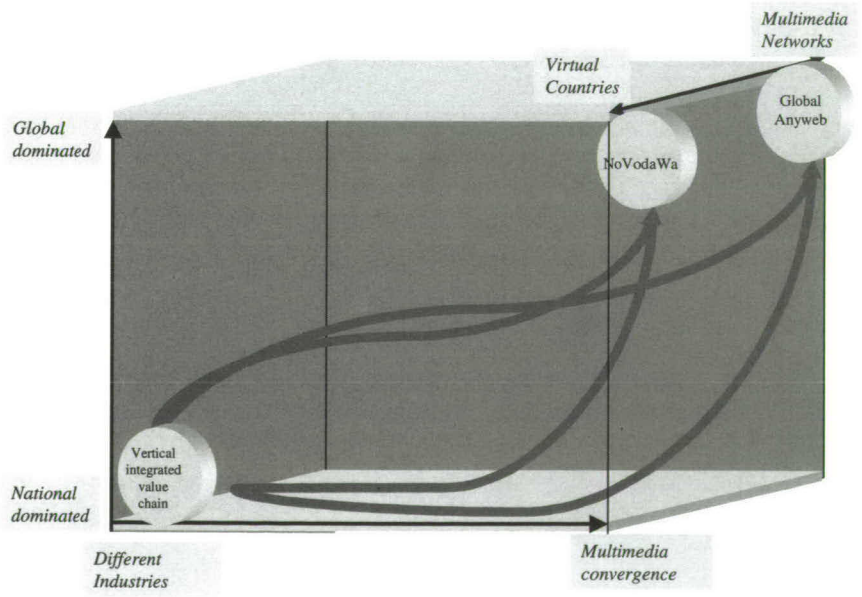
6.4 Selection of leading indicators and signposts

The scenarios described in this process show the future end-stages of possible industry developments. The managerial task is to understand what the signs are for industry development in one or the other direction. Peter Schwartz describes this step in the following way:

> *Once the different scenarios have been fleshed out and their implications for the focal issue determined, then it's worth spending time and imagination on identifying a few indicators to monitor an ongoing way. If those indicators are selected carefully and imaginatively, the company will gain a jump on its competition in knowing what the future holds for a given industry and how that future is likely to affect strategies and decisions in the industry. (Schwarz 1996:247)*

To understand the possible moves of telecom operators into the multimedia future, I have created a visual representation. The trends convergence, globalisation, and industry structure define the axis. The NoVodaWa and Global Anyweb scenarios are presented as end-states.

Figure 54: Development of the scenarios



The figure describes the possible evolutions as different lines going from the current stage of a nationally oriented, vertically integrated telecom operator to a future

global multimedia corporation. Ms. Gil Ringland uses the term storyline for the description of this evolution. She proposes providing a "storyline" for the communication and application of scenarios in management processes. The storyline explains how it is possible to achieve the end-stage and which indicators lead to one or the other scenario developing more strongly in industry evolution. However, the storyline is primarily a tool that makes it easier to communicate the findings, and not just the end-stages. (Ringland 1998:99)

The figure shows that the trends toward convergence, as well as the multimedia industry, will be global. I assume that the development towards the end-stages is occurring simultaneous to several of the trends reshaping the industry. The uncertainty is the pace of the individual trends and the dominant industry structure in the "final" stage. This understanding will help a telecom operator in its development towards a multimedia corporation. For the individual telecom operator, it means following one of the paths towards his favourite end-stage, but always keeping market development in mind. If the market, due to competitive moves or new technologies, demands more converged features on a national basis, or more traditional telecom services, but on a global scale, then the telecom operator needs to adapt its offering or organisation to meet the demand.

The following three industry examples of potential strategic moves from telecom operators could all lead to the same industry end-stage:

1. Two incumbent telecom operators could merge on all vertical levels, ignoring in the first step the convergence and de-fragmentation of the value chain (Deutsche Telekom could merge with Telecom Italia).
2. Simultaneously, another telecom operator, or even the same one, could create a joint venture with a national media house, neglecting globalisation and de-fragmentation in order to be first on a national scale (T-online's cooperation with "Bunte" and "Bild").
3. The third telecom operator could start a joint venture on a horizontal level with a global approach (KPN merging with Qwest to be first as global carrier in the fixed network infrastructure market*).

These examples show that there is no generic guideline for all participants in the emerging multimedia industry. However, depending on the international option chosen, the market can be observed for the specific signpost, thus justifying or questioning the chosen scenario. In any case, an understanding of the alternate plausible future scenarios will result in a change in selected strategy that can be implemented quickly and efficiently, and that will consequently deliver a competitive advantage.

* KPN Qwest was originally one of the interesting study cases for international strategy. However the approach failed and KPN Qwest had to file a petition in bankruptcy in 2002.

6.5 Conclusion - International Corporate Strategy in the Multimedia Industry

The goal of this chapter is to combine the developed activity framework of the multimedia industry and industry scenarios into the corporate strategy process.
I have conducted the process in several steps:

1. *Map the current location of the multimedia participant in the activity framework* - the classic telecom operator covers just a portion of the future multimedia activity system and has limited international experience.
2. *Analyse the globalisation potential of the activities* - Potential varies significantly between the activities, which demands a differentiated globalisation strategy.
3. *Analyse the implications and develop strategic options based on the scenarios* – The strategic options depend upon the current position of the multimedia participants.
4. *Integrate the trends with a clear enough future* – The trends with a clear enough future are crucial to the implementation of strategic options on the business level.

I have provided examples for different types of industry participants and can sketch the strategic options. The table below summarizes the strategic options for the individual players.

Figure 55: Recommended strategic options

	Small Medium Telecom operator	*Large Telecom operator*	*Other Multimedia Participants*
NoVodaWa	Decorate	Create	Depends
GlobalAnyweb	Focus	Spin	Depends
The Orchid Net	Cooperate	Develop	Integrate

Some issues are relevant for all options and multimedia participants, for example:

The industry should be observed continuously. A permanent monitoring of market developments ensures that signposts of the scenarios are detected in a timely manner. Strategic actions can then be taken, depending on the dominance and opportunities of one or the other scenario.

For all scenarios, it is advisable to conduct an internal deconstruction of the value chain in order to react to the trends of convergence, globalisation, technology

improvements, and other changes in the industry. The internal organisation can be mapped in the activity framework of the multimedia industry, specifically:

- The globalisation drivers of the individual activities provide the underlying logic for the international expansion process.
- International acquisition options or extensions should be benchmarked by taking the multimedia activity framework and the chosen scenario into consideration.

The scenario planning methodology has been the guideline in this chapter. Following Peter Schwartz's methodology, the implications for the individual corporation and the signposts in industry development have been discussed. The results have to be in a form that management is interested and willing to accept the plausibility of more than one future. '(Heijden 1996, Wack 1985)

> *"The prime question to be addressed is whether the organisation is well equipped for the futures we can see coming. The way this is achieved is by considering the business Idea, the characterisation of the organisation, against the scenarios, the characterisation of the future business environment, to establish the degree of fit."..... "This leads to the fundamental rule of scenario planning: Once I have decided on the set of scenarios of the future which are considered relevant to our situation, each scenario is treated as equally plausible." (Heijden 1996:107)*

The strategic options presented for the different industry participants can be treated equally. The real benefit of the scenarios is achieved when management has understood the scenarios and their implication, and is willing to adapt to the new thinking.

> *"It happens when your message reaches the microcosms of decision makers, obliges them to question their assumptions about how their business world works, and leads them to change and reorganize their models of reality."(Wack 1985:3)*

This is a process breaking with traditional thinking and challenging the management team. Peter Schwarz states:

> *"You can tell you have good scenarios when they are both plausible and surprising; when they have the power to break old stereotypes: and when the makers assume ownership of them and put them to work." (Schwartz 1996:248)*

Liam Fahey sees two purposes, both related to the extreme end-states of the industry scenarios:

> "The managers might then return to their original concern: How would the current strategy play out in these technologically distinct end states? They might also ask how these scenarios might generate new strategy alternatives – alternatives that most likely they had not previously considered." (Fahey 1998:197)

The result of Part II and III is a structured application of the scenario planning process for an industry analysis of the industry. The concept is enhanced by the reflections and development of the activity system. The combination of the two concepts creates the design for a corporate strategy process in uncertain environments.

The specific case of network-based industries following deregulation is an application where uncertainty demands such an exhaustive process. The collection of diverse industry trends can be integrated into one concise model.

The critical issue in the corporate process is the introduction and the use of knowledge on the management level.

7 Reflection and contribution

My research on international corporate strategy was based on the empirical need to define a strategy for entering the Austrian telecommunications market. The original purpose of this book was an analysis and discussion of the globalisation drivers and resulting strategy for the expansion of telecommunication services from Switzerland to Austria.

During the research phase, it became obvious that such a discussion would underestimate the reality. The ongoing trends in the market required expanding the perspective from the telecom industry to the multimedia industry. This expansion became necessary due to the effects of deregulation, which, along with other drivers, have brought about the convergence of telecommunications, IT, broadcasting, and media industries.

The change in focus from the telecom to the multimedia industry solved the problem of oversimplification, but at the same time created the problem of high uncertainty. It was clear that industry structure would fundamentally change, but it was still unclear as to how industry structure would develop in future. To deliver substantial and sustainable results, it became necessary to develop a framework that is able to handle the level of uncertainty. The framework is a combination of the application of existing tools and individual extensions. In the next section, I will compare the new framework with the analysis of globalisation drivers from George S. Yip (Yip1992).

The framework can be applied as a generic strategy process in network-based industries. The value increases under similar industry conditions that result from deregulation and concurrent changes based on several trends with a high impact on the industry structure.
In the second section, I will show how the framework can be applied in the utility industry.

The framework addresses some of the uncertainties and assists management in defining future strategy. However, it leaves other uncertainties and decisions open for managerial actions in expanding internationally on a business level. In the last section, I will provide some insights into how future developments could enhance the corporate strategy process.

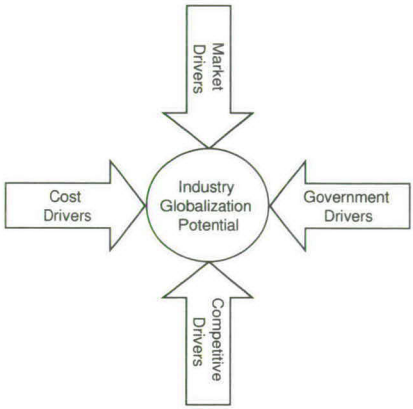
7.1 A new approach to international corporate strategy

This book emerged from the strategic question:

How can a vertically integrated incumbent telecom operator sustainably extend its geographical scope after deregulation in the changing industry?

One perspective in addressing this question would be a classical issue of applying globalisation concepts, one of which I applied in chapter 3. The analysis of the "globalisation potential in the industry" (c.f.3.4) could provide an excellent conceptual basis for answering the strategic question.

Figure 56: Industry globalisation potential



source: Yip (1992)

I used this concept as the basis for Part I, "The Telecom Arena", and the content was presented in the following way:

- After introducing the invention of telecom services and the classic telecom operator, with its national territory, vertically integrated value chain, and international solutions, I turned to the government drivers.

- The **government drivers** showed the development steps from the national monopoly to the deregulated, competitive markets. The expectations for the period following deregulation serve as globalisation drivers for the three dimensions market, cost, and competition. The overall assumption as

a result of deregulation is better service quality, shorter innovation cycles, and lower cost.

- Under the topic **cost drivers**, I handled the specific economics of network-based businesses, namely switching cost and infrastructure characteristics. In addition, new technologies like IT-enabled service applications and higher bandwidth demand economies of scale that can be achieved by going international.

- Based on the above driver, I investigated the **market drivers**, for which I integrated the trends of convergence of telecommunications, media services that customers currently demand, technology, especially new mobile applications that demand international access and content, and the globalisation of businesses that demand global telecommunication services. The rational of network externalities support these trends. The topic of globalisation serve as the bridge to competitive drivers.

- **Competitive drivers** in the telecom industry can be seen through emerging national competition, and more importantly in this environment, the attempts to build international telecom operators and the failures resulting from these attempts. The general trend in the change of industry structure and the failures and problems in the telecom industry provided the basis for the Part II of this book.

The important issues of Part I were all integrated into the concept. The structure already pointed more strongly towards international strategy than the applied collection of trends and analysis of the history and economics in the telecommunications industry.

The reason why I did **not** write Part I as an analysis of globalisation potential is explained in the following section.

7.1.1 The new international corporate strategy process

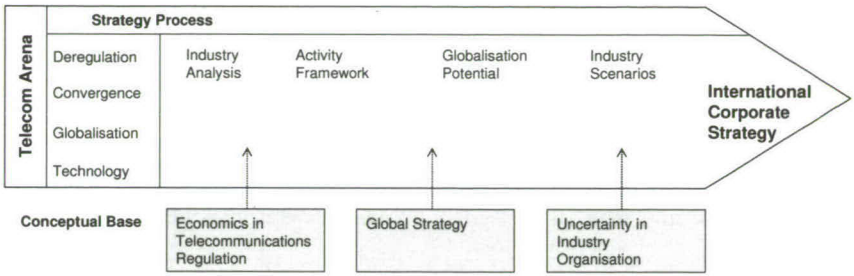
There were two major reasons why I sought a new approach, which eventually led to a result overcoming the following limitations for the development of the new framework:

1. The strategic question was raised in an early deregulation phase (phase 2 c.f. 2) on the corporate level. At this stage, it is necessary to answer the question "what business should we be in?". The analysis of industry globalisation potential assumes a given business definition and analyses the potential within that business. In this case, I would have tried to define an international corporate strategy in the telecom industry while neglecting the change in the industry definition. In this book, I focus on corporate strategy with a long time horizon and a broad industry perspective, which means that the given questions have to be answered for the emerging multimedia industry. A corporate strategy for the telecommunications industry would neglect the importance of the ongoing changes in the industry, and could become obsolete in the foreseeable future.

2. George Yip provides a detailed checklist for the kind of content that is necessary to plan an international expansion. The complete description of globalisation drivers should include issues like growth rates, market share, and competitors. This level of detail enables a corporation to develop a concrete business plan. The analysis in Part I showed that the telecom business is undergoing fundamental changes. The future industry will be the global multimedia industry and not the classical national, vertically integrated telecom industry. However, the uncertainties of this evolution make it difficult to define the drivers adequately.

Therefore, I needed to take a different path to be able to provide sustainable answers to the strategic question. I developed a new framework that combines several concepts into a concise corporate strategy process. The figure on the next page shows the elements of the strategy process that lead to the results presented in this book.

Figure 57: Integration of theoretical concepts into the strategy process



The industry analysis integrates the facts as well as the uncertainties. The analysis of the telecom history, the industry trends, the understanding of the deregulation process, and the economics of regulation are the foundation for this book. The knowledge gained led to the formulation of the problem definition and provided the basis for further discussion.

The activity framework defines the boundaries and the content of the converged multimedia industry as individual activities. The globalisation potential is analysed based on the underlying rationale on the activity level, and serves as part of the framework for the location of the future business in the multimedia industry.

The uncertainties within the industry environment are handled by applying scenario planning. The three developed industry scenarios NoVodaWa Country, Orchid Net, and Global Anyweb provide the picture of potential end-states in industry development. Corporate strategy in an uncertain environment requires the consideration of all three plausible types of industry evolution.

Based upon the developed framework, I turned to the corporate perspective. For different players in the multimedia industry, I defined international corporate strategy options. By applying the scenarios, based on the multimedia framework, I laid out potential positions for the future corporate perspective, and analysed competitive moves and set the goal for different business level strategies. The scenarios enable management to define managerial actions and change course if the signposts move in a different direction.

7.1.2 Comparison of the concepts

It was necessary to conduct the complete strategy process, from the industry analysis to the strategy definition, in order to position the developed elements and their practicability in the strategy process. However, there are several differences between the outcome when the "Yip Concept" is applied as opposed to the new framework. The table below gives an overview of the major differences of the two concepts:

Figure 58: Comparison of the globalisation potential analysis with the new framework

	Yip	*New Framework*
Industry Definition	Telecom Industry	Converged Multimedia industry
Globalisation Driver	Current drivers	Future drivers
Strategy Focus	Business level	Corporate level
Knowledge Base	Facts	Facts & uncertainties
Next Process Step	Country selection and quantification	Defining business level strategies

The analysis of globalisation potential assumes a given industry definition with drivers addressing the current issues in the industry. I argue that the telecom industry will not exist in the long-term future, and thus, strategy needs to be developed for the future multimedia industry.

For a given industry definition, the discussion of international strategy is based on the current business position. On the other hand, I have taken the corporate position and have attempted to locate the future business in the activity framework. In addition to the facts, the future perspective leads to the necessity of integrating several uncertainties.

The outcome of the two strategy concepts is quite different. The analysis of globalisation potential could result in the definition of business strategy and country selection. In contrast, my framework requires some additional steps in defining the international businesses that the corporation wishes to participate in the future.

7.2 Application in other network-based industries

The title of this book is "International Corporate Strategy in Network-Based Industries". Up until now the industry examples focused on the telecom industry, and in particular, the multimedia industry. However, I argue that the developed framework can be applied in other network-based industries using the same process. The airline industry, logistics, and utilities have all been undergoing the process of deregulation and major restructuring in their industry organisation. In all of these industries, developments have led to a high degree of uncertainty through the convergence and globalisation of some activities. In this section, I will show how the framework can be applied to other network-based industries.

The power supply industry is a good study case to show how the elements of the framework can be applied. It is out of the scope of this section to look at each step in detail. Therefore, I will focus on the similarities between the two industries. However, some differences are worth mentioning here, which will help to set some of the statements in the right proportion:

- The consumption patterns in the power industry are stable compared to those in the telecommunications industry, which is driven by mobile telephony and the internet.
- The power industry is a "one-way" industry, in which energy is transported from the producer to the consumer. In contrast, communication between two participants is one of the core elements in the telecommunications industry.
- The importance of electricity and the ability to generate it using independent facilities creates markets without interconnection to the network[42].
- Power generation is based on natural resources where the rules for supply are dependent on political and geological specifics.
- Environmental regulation is one of the factors increasingly defining the rules for power generation[43].

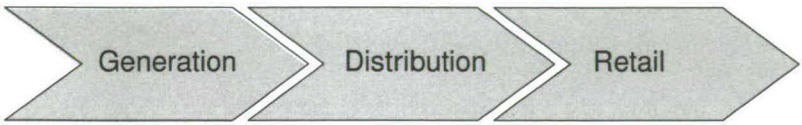
The specific issues in the power industry led to some problems during the process of deregulation. One of the signposts for failure in the development towards a market-driven industry is the "California power problem". Failure in the deregulation of the California power industry has proven that there are high risks involved in the deregulation process. This case also highlights the importance of a careful strategy design and of setting expectations that are in line with market behavior.

[42] Ships in the ocean would be one example producing their own electricity. Economical more important are small power plants for households or communities, where natural resource are used.
[43] The Kyoto protocol sets limitations for the allowed emissions of power plants.

7.2.1 The power supply arena

The utility industry is classically associated with the activities of power generation, distribution, and retailing. These three activities form the core elements of the utility industry's value chain. Under monopoly markets, these activities were integrated in one monopoly system.

Figure 59: The power supply value chain



In Europe, deregulation of the power industry followed that of the telecommunications industry. To create an internal market in Europe, the deregulation legislation was implemented in February,1999, one year after deregulation in the telecommunications market took place (EU 1996/92). Based on interconnection with the distribution network of the incumbent, new entrants could sell electricity to corporations at a less expensive rate and with varying service quality.

The power industry context is influenced by the same trends as the telecommunications industry. Globalisation, convergence, new technologies, and changes in the industry structure create the need for a new industry definition. The converged industry is the utility industry, which includes gas, water, and electricity supply.

Power generation is changing due to new technologies and environmental regulation. New technologies are using wind, solar, hydropower, and gas, which are substituting coal and nuclear power plants (American Gas Foundation 2000). Fuel cells, micro gas generation units, and substitution through local gas generators can reduce the need for prohibitive infrastructure investments (Leslie et. al. 1999).

On the distribution and retail side, convergence between different networks can create synergies that lower the cost base. Cable TV, gas, telephony, and power networks are all going to the same households. However, different companies manage the construction maintenance and billing processes of the networks, which are integrated towards the customer access. Convergence of local distribution and retailing into one utility industry is one of the expected outcomes. For example, RWE and E-ON AG are German players that are focusing on the convergence between gas and power.

7.2.2 International utility activities

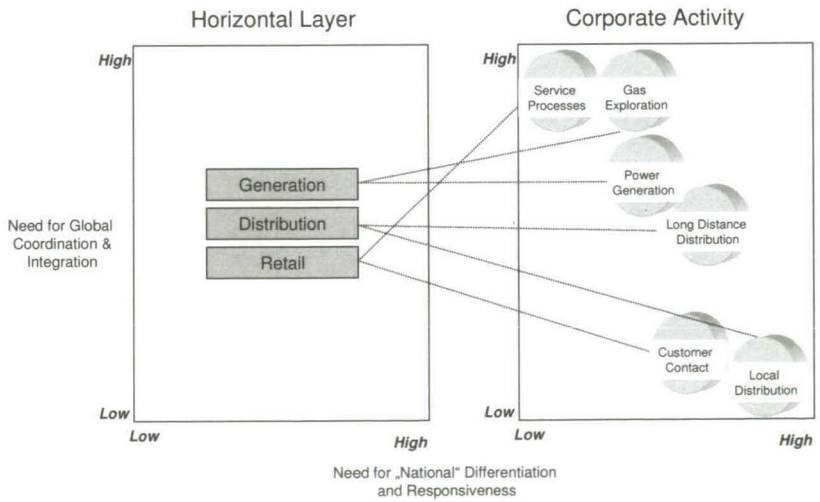
The convergence of several industries as a result of deregulation creates similar problems for the emerging utility industry as for the multimedia industry. The integrated power supply value chain is expected to be unbundled, and the individual activities will be integrated in the new activity framework. (Leslie 1999).

Consequently, the new industry would have quite different characteristics in its production activities, power generation, gas exploration, and water treatment. However, the activities in the service provisioning and geographical characteristics of the local distribution networks would remain the same for the same customers. The use of synergies and the economies of scale in some of the activities are driving the convergence process.
The activities of the utility industry can be mapped in an activity framework similar to the framework for the telecommunications industry.

The concepts "analysis of the globalisation potential", as well as the "dynamics of network-based businesses", has the same relevance for utility networks. The anatomy of the transnational can be applied to show where in the utility value chain globalisation potential can create international business opportunities.

Using the figure below, I have created an example in which I split the value chain into individual activities and map them in the anatomy of a transnational concept.

Figure 60: The anatomy of a transnational – Utility industry



The generation activities have different requirements for global coordination. Especially gas exploration, with the involved pipelines and tanker, is a global business. At the same time, power generation can have global and local facets for the same type of energy. Wind and solar energy can be produced locally for one household, as well as in huge plants in deserts or on the open sea.

The distribution activities have similar dynamics than the multimedia transportation activities. The local distribution undergoes the universal service obligation, where long distance distribution follows the main lines, thus having a lane concentration.

The retail process also has similar characteristics than in the multimedia industry. The service processes and the customer base are identical for the different utilities. Global customers want global contracts to leverage their buying power, whereas local customers need a local contact. This fact creates some opportunities for synergies on the local, as well as global scale.

7.2.3 Utility industry organization and international corporate strategy

There are different uncertainties and drivers in the utility industry than in the telecommunications industry. The outcome of the scenario planning process for the utility industry is expected to show additional aspects. Especially the usage of natural resources and the specifics of regulation are quite different for the utility industry than for the multimedia industry. However, to show the transferability of the process, I assume the utility industry will follow similar trends, which is supported by the following examples:

- RWE and E-ON AG can be imagined to join forces with other large corporations to form a new NoVodaWa.
- "Green Energy" and "Secure Energy" could define specific user groups developed out of networks forming some Orchid Nets.
- Regional power suppliers and/or small power generation units can be imagined to form a new Anyweb.

These examples show that different outcomes in the development of the utility industry are possible. Each of the examples seems plausible at first glance, and could be explored further.

The perspective of an individual corporation arising out of the integrated monopoly position is similar to that of a classical telecom operator. Based on the size and ability to execute the strategy, the different scenarios can serve as a guideline for the strategy definition. The individual activities of the current value chain need to be analysed in detail to see where globalisation potential could create some strategic options.

What can already be recommended synchronous to the multimedia industry is a focus on the horizontal activities, customer segmentation, and the integration of the value chains as a network of activities. The structure of the organisation should be designed in a way that a company can react quickly to new market conditions in case of a change in the industry structure. The potential end-states need to be defined through a dedicated scenario planning process.

7.2.4 Conclusion

The last section provided some evidence that the chosen methodologies, together with the developed enhancements, can be applied in the international corporate strategy process in other industries. The example of the application of the process in the utility industry demonstrates the universality of the developed framework. The deregulation of the European power industry took place one year after deregulation of the telecommunications industry, and created similar industry conditions.

The components "activity framework", "anatomy of a transnational", and "industry scenarios" could be applied in the converging utility industry and instantly create results which seem plausible. The flexibility of the methodologies in the developed framework makes it easy to transfer the process to other industries.

In the above sections, I have shown how the international corporate strategy process can be conducted with the developed framework in network-based businesses. The basics of the chosen industry need to be explored, and the trends need to be integrated for a broad future industry definition. The activities in the future industry can be analysed for their globalisation potential. The outcome can be integrated in the scenario logic which reflects the industry organisation. The two elements together serve on the corporate level for the definition of the strategic options and knowledge about potential industry developments.

However, the entire process needs to be conducted from the perspective of an individual corporation. The current position of the corporation defines the level of impact and uncertainties and the resulting scenario logic. The transfer to other industries or corporations has to be done carefully to develop concrete strategic options and ensure that all industry specifics are considered.

7.3 Outlook

I am convinced that the developed framework will support managers in the international corporate strategy process. However, applying this exhaustive strategy process still leaves several questions open, for example:

- Which of the scenarios will be the one to follow?
- What are the numbers behind the activities?
- What action should be chosen on the business level?

I see several developments in academic research and managerial practice that address these questions:

- The growing importance of simulations in business is one of the fields delivering quantitative outcome that supports the classical business planning process. However, the quality of the simulation models depends on the knowledge and expectations fed into the system. The activity framework and the scenarios can serve as part of a simulation model. (c.f. 6.4).

- As a result of increasing uncertainties, game theory is becoming popular in management. The development towards the end- states can serve as the boundaries and the strategic options can be played using real industry participants that are heading towards the same geographical markets.

- In daily managerial practice, change management assists organisations in handling uncertain industry developments. However, clear future perspectives as developed with the scenarios are the underlying essential for the change management processes (c.f.6.5).

In closing, I would like to mention one of the developments in evolutionary theories. For the perspective on the development in the industry, Joseph E.Stiglitz states in his Nobel prize lecture in 2001:

> *"Finally, I have become convinced that the dynamics of change may not be well described by equilibrium models that have long been at the centre of economic analysis....Dynamics may be better described by evolutionary processes and models, than by equilibrium processes.(Stiglitz 2001:521)"*

Economic theory tends to describe the world in simplified models "assuming everything else stays equal". In this book, I used an integrated process that allows the surrounding factors to change. I took this risk, knowing that the result of such a process can be questioned from many aspects. However, I am convinced that this way of thinking is a more accurate reflection of reality in the corporate strategy process, and that it covers a broader aspect of industry evolution. Stiglitz, who proposes the evolutionary process, refers to Charles Darwin, who realized the same behaviour in nature after visiting the Galapagos Islands:

> *The plants and animals of the Galapagos differ radically among islands that have the same geological nature. The same height, climate, etc... This long appeared to me a great difficulty, but it arises in chief part from the deeply seated error of considering the physical conditions of a country as the most important for its inhabitants: whereas it cannot, I think be disputed that the nature of the other inhabitants, with which each has to compete, is at least as important, and generally a far more important element of success. (Darwin quoted in Stiglitz 2001:522).*

This experience of the evolution process is similar in nature to the expectations I described for the multimedia industry. The development of the industrial organisation may have elements of the scenarios that differ in the geographical regions, depending on the nature of the economy, customer behaviour, and the intensity of competition.

8 Appendix

8.1 Appendix- Telecom definitions

The following definitions are extracted from the European Telecommunications Services – Monitoring European Telecoms Operators: Final Report Analyst IDC EMEA, January 2002.

8.1.1 Fixed telephony

PSTN/ISDN population penetration: the number of business and consumer public-switched telephone network (PSTN) lines and integrated services digital network (ISDN) channels per 100 percent of a country's population.

PSTN/ISDN household penetration: the number of residential PSTN lines and ISDN channels in service for consumer use, per 100 percent of a country's households. IDC's model for calculating PSTN/ISDN consumer connections takes into account households with more than one line, thus those numbers are included in the household penetration figure. PSTN/ISDN connections used for business purposes, even in the case of self-employed users, are *not* counted in PSTN/ISDN household penetration, as those connections will be paid for by a business rather than for personal use.

- A *PSTN line* is a single analog access line for each wire in a twisted copper pair.
- An *ISDN channel* is a channel is equivalent to a conventional analog line. A single ISDN line is either **Basic Rate Interface ISDN** which provides two bearer channels (B-channels) at 64Kbps and one data channel (D-channel) at 16Kbps, or **Primary Rate Interface ISDN**, which provides 30 B-channels at 64 Kbps and 1 D-channel at 64 Kbps.

IDC reports PSTN lines and ISDN channels as one figure as most European operators now report these services in this way, and do not split PSTN/ISDN in their operational reviews.

Fixed telephony revenues: Total revenues generated by PSTN/ISDN voice services to end-users, including local, international, fixed-to-mobile, and dial-up Internet access calls, both monthly and connection fees. Revenues from managed data (X.25, frame/cell, IP-VPN, etc) and leased line services are not included.

8.1.2 Mobile

Mobile penetration: the number of business and consumer mobile connections per 100 percent of a country's population.

A *mobile connection* is a SIM card connected to a network. Only connections from *active users* are included. IDC defines an active user as one who has made a call on the network in the last three months.

Mobile revenues: total revenues generated by mobile subscribers, including voice, SMS, and 2.5G data services.

MVNO: An operator which does not own its own network but rather leases capacity on another operator's network to provide mobile services. IDC considers only

operators who provide some form of network management as well as the service to be MVNOs. Simple air-time resellers are *not* included in this category.

3G: Third generation, referring specifically to mobile services. Also known as UMTS in Europe (see abbreviations list below), this technology will enable existing voice and data services to be delivered at a faster rate and higher quality, as well as provide for new services to mobile such as video.

8.1.3 Internet

Internet connections: the total number of business and consumer connections to a single dial-up or permanent account. These include connections over broadband services (cable modem, DSL, BFWA, direct fiber, etc) and leased lines (see definitions to follow). Business connections include home workers whose connection is paid for by a business.

An illustration of the variables and methodology IDC uses in forecasting Internet connections follows on the next page in Figure I-1.

Dial-up access: Connecting to an ISP by making a call via modem over the PSTN/ISDN network. The user pays the ISP for access, usually charged on a per-minute basis.

Subscription-free access: In this access method, the user pays only for metered call charges, which are split between the originating operator (e.g. BT), the terminating operator (Energis) and the ISP brand company (Freeserve).

Unmetered access: This refers to a dial-up (PSTN or ISDN) Internet access service with no time-based charge (.e.g. per-second or per-minute). Typically such a service would be charged by the ISP, by the telecom operator, or by both, or by the ISP on behalf of the operator on a flat-rate basis (e.g. a fixed monthly subscription.)

Flat-Rate Internet Access Call Origination, or FRIACO: A form of dial-up access which allows other operators and ISPs to compete with the incumbent in providing flat-rate access packages.

Internet hosts: The Internet Software Consortium (www.isc.org) defines an Internet host as being a domain name that has an IP address (A) record associated with it. This would be any computer system connected to the Internet (via full or part-time, direct or dialup connections). A *domain name* is any name representing any record that exists within the Domain Name System.

8.1.4 Broadband

Broadband connections: the total number of business and consumer connections via broadband technologies: DSL, cable modem, BFWA, or fiber.

- cable modem connection: a connection using a cable modem, be it a stand-alone device or set-top box, to send and receive data via a hybrid fiber coax (HFC) network.
- Digital subscriber line (DSL) connection: a connection using any DSL technology to transport data over a twisted-pair copper wire from the local exchange to a business premises or residence. Fiber to the curb connections using VDSL from the curb to the building are excluded.

- Broadband fixed wireless access (BFWA) connection: a connection using a radio-based point-to-multipoint system operating within the 3.5 GHz, 10 GHz, 26 GHz, or 28 GHz frequency band. Not to be confused with narrowband fixed wireless, known as wireless local loop or WLL.
- Fiber connection: a connection using a fiber-optic cable either to the curb, building, neighborhood, or home.

There are numerous DSL variants, but in Europe, there are two main types of DSL technology on offer:

Asymetric DSL (ADSL): The most recent ETSI ADSL modulation standards refer to the version of Quadrature Amplitude Modulation (QAM) known as Discrete MultiTone Modulation (DMT). In this version, the data channel is split into a number of sub-channels, allowing flexibility in terms of the allocation of data across the "breadth" of the pipe. Over the course of its development, achieved (although not necessarily commercially available) transmission speeds for ADSL have increased from 1.5Mbps to 9Mbps downstream and from 64kbps to 1Mbps upstream, dependent upon line length and quality. This disparity between downstream and upstream transmission speeds is what gives ADSL the asynchronous part of its name and makes it ideal for the kind of applications that demand plenty of downstream bandwidth, such as surfing the Web, but a limited amount of upstream capacity. These attributes fit best with the requirements of residential and small office/home office (SoHo) business users.

Symetric DSL (SDSL): SDSL uses a single twisted pair for variable-rate connections at rates ranging from 160Kbps to 2Mbps with intermediate speeds in between. The technology is primarily suited to business applications where symmetrical bandwidth is required. However, SDSL as originally defined is evolving into several upcoming technologies and standards such as HDSL2 and GSHDSL that combine symmetrical transmission with additional advantages.

Other types of DSL include:

High bit-rate DSL (HDSL): HDSL is a mature version of symmetric DSL that utilizes two wire pairs (four wires). HDSL is primarily used to provide leased-line services because the telephone companies own and operate the HDSL equipment and provide the user with a conventional T1/E1 interface.

HDSL2: HDSL2 is a full-rate-only symmetric service, but it is different from HDSL in that it exists over a single twisted pair. HDSL2 was specifically conceived to work alongside asymmetric services such as ADSL without causing interference, a property known as "spectral compatibility." This coexistence with ADSL is crucial, and in this regard, the technology is superior to SDSL. The problem is that currently it costs much more than HDSL and compared with SDSL, is not rate adaptive.

G.SHDSL: G.SHDSL has recently been standardized by the ITU (International Telecommunications Union) and combines the best of SDSL with the best of HDSL2. It is now becoming the accepted standard for SME class DSL access in both Europe and the United States. The standard defines multirates, as SDSL does today, but with the spectral compatibility of HDSL2, and provides symmetrical bandwidth of up to 2.3 Mbps.

G.Lite: G.Lite is a splitterless substrate ADSL technology which was approved by the ITU in June 1999. "Splitterless" refers to its need of a line filter device to separate the voice and data frequencies. The G.Lite spec calls for 1.5Mbps for downstream service and 384Kbps for upstream transmissions. G.Lite is easier to install and deploy than full rate ADSL, as the chips are less costly and use less power.
ISDN DSL (IDSL): IDSL uses standard ISDN terminal adapters with symmetric speeds at 128Kbps and up to 144Kbps using non-standard terminal adapters. IDSL is largely a data-only version of ISDN. In Europe, where ISDN is far more widely deployed than in North America, IDSL has little added value.
VDSL: VDSL is a component of a fiber-to-the-curb network and can provide symmetrical and asymmetrical data rates in excess of 50 Mbps. Data access depends upon the length and condition of the line, as is the case for most of the DSL technologies. For example, at 300 meters VDSL can achieve 26Mbps and at 1,500 meters it can still manage 6.5Mbps.

8.1.5 Cable TV (CATV)

CATV connection: A fixed connection between a CATV provider's network node and a consumer premise, used to deliver paid TV services. Broadband connections via cable modem are not counted in this category, but rather in the broadband connections section.
CATV homes passed: The total number of households which are within the vicinity of a cable operators' network and thus capable of subscribing to CATV service even if not actually doing so.

8.1.6 Leased lines

Leased line connection: a fixed connection (transmission circuit which is permanently established) between two points. It is sometimes referred to as a leased circuit or private line. The data included in this report refers to one entire connection. In this report, only end-user connections which generate revenue are counted.
These lines are used for applications such as private network/Intranet (voice and data), dedicated Internet access (excluding dedicated Internet access via a VPN service), and data downloads.
Lines provided by the PTO for other carriers, sometimes referred to as wholesale leased lines, are not included in this report.
Leased lines have been segmented as follows:
Analogue leased lines: these provide voice and data traffic at speeds up to 56Kbps.
Digital leased lines: these can be used to carry voice, video, and data traffic, at speeds between 9.6 Kbps to 155Mbps and above. Digital leased lines are divided into four bandwidth categories:

- Up to and including 64 Kbps
- Greater than 64 Kbps but less than 2Mbps
- 2Mbps
- Greater than 2Mbps

Foreign investor share of market: the share of the market that goes to direct foreign investors, i.e. investors which own a *direct* stake in a joint venture or a subsidiary. Investment via publicly traded shares abroad, as well as portfolio investment, are not included, as these are impossible to estimate accurately. The information in this report is as of October 1 2001.

Foreign investor shares for mobile services do *not* include investments for 3G licenses. Only foreign investments attributed to operators generating revenue from commercial services are counted. For a list of 3G licenses that have been awarded in member states plus Norway and Switzerland, see Appendix C.

8.1.7 Regulatory

LLU: Local loop unbundling, the process by which incumbent operators offer alternative operators access to their local exchanges, so that the alternative operators do not have to build their own access networks and are not dependent on the incumbent for last-mile access. Another method of LLU, via line sharing, is not yet available in most countries in Europe.

CPS: Carrier preselection, the process by which users of fixed-line telephony can subscribe to an alternative operator without having to dial a prefix. IDC does not consider CPS to be available in a country unless it is available for local and long-distance services; some countries claim to offer CPS but do not make it available for local calls.

NP: Number portability: the ability of a telephony user to keep their phone number if they switch carriers. This report refers to fixed and mobile NP for member states and Norway and Switzerland only; mobile NP in candidate countries is not covered as those countries rapidly evolving legislative processes make it difficult to establish when mobile NP has/will occurred.

Where available, specificity as to whether fixed NP includes users who have changed geographical locations versus those who have stayed in the same place yet changed carriers. However, most regulators and operators do not report these differences, even if they do provide number portability statistics.

IDC has chosen to use the word "dominant" to describe positions of certain providers in the market where they have a market share of at least 51%. Wherever possible, statistics on market shares have been provided to support this. However, statistics, particularly in terms of ISPs, are not always available; in those cases, IDC is making a judgement based on its knowledge of market conditions through interviews with providers and end-users.

8.2 Appendix – Swisscom Company Profile

With revenues for 2002 of CHF 14.52 billion and 20,470 employees, the Swisscom Group is Switzerland's leading telecommunications company. Swisscom offers a comprehensive range of telecommunications products and services and is the clear market leader in mobile and fixed voice and data communications as well as Internet-based services.

Fixed network communication at Swisscom is currently dominated by the boom in broadband services: In 2002, the number of ADSL accesses rose from 40,000 to 195,000. In addition, at the end of 2002 Swisscom Fixnet had 3.2 million analogue telephone lines and 2.2 million ISDN channels. Swisscom Mobile increased its customer base to 3.6 million over the previous year and launched various innovations such as MMS (Multimedia Messaging Services) and Corporate Office Access. The mobile network provides coverage in 99% of the populated area of Switzerland. Since February 2002, Swisscom Mobile has been offering the new GPRS data transmission standard. In December 2002, Swisscom launched Public Wireless LAN. This service comprises local networks that enable wireless and broadband Internet access. Enterprise Solutions is the point of contact for around 60,000 business customers and specialises in providing complex and customised integrated solutions. Swisscom IT Services is one of the leading providers of IT services in Switzerland. With Bluewin, Swisscom operates the largest online portal in Switzerland for residential customers. debitel, Swisscom's foothold abroad, offers innovative services and applications in mobile, fixed network and Internet communications to around 10 million customers in Germany, France, the Netherlands, Denmark and Slovenia.

As a company primarily focused on its home market, Swisscom aims in future to maintain its market leadership in its core businesses of fixed network and mobile communications and to invest in related growth businesses. To strengthen its position even further, Swisscom also intends to make targeted investments in Europe as well as enter into partnerships and expand the debitel business model.

Swisscom in brief*

- Revenues: CHF 14.52 billion
- Operating income (EBITDA): CHF 4.41 billion
- Fixed network channels: 5.3 million
- ADSL accesses: 195,000
- Mobile customers: 3.6 million
- debitel customers: 10 million
- Bluewin customers: 860,000
- Employees: 20,470
- Incl. apprentices: 872

*) Swisscom Group key figures at 31 December 2002 (Swisscom 8/2003)

8.3 Appendix - TOGEWAnet- Two way Interconnection

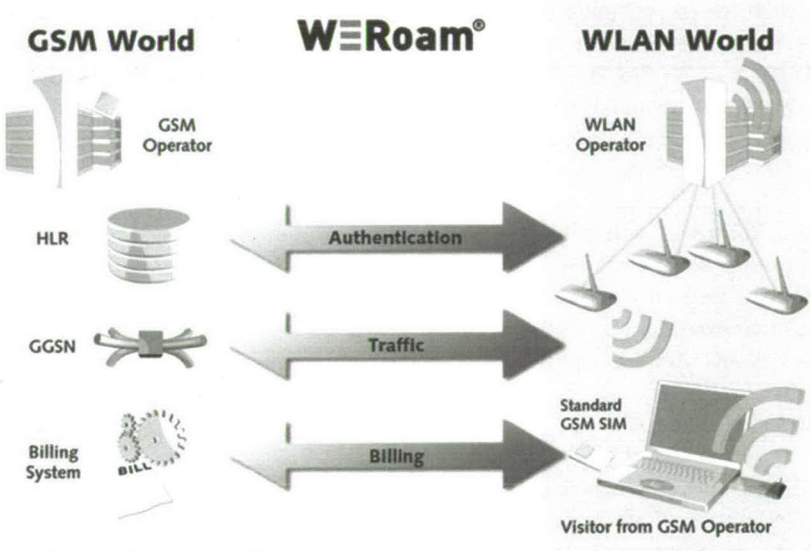
WeRoam® – The Service

The WLAN market expansion has been centered around individual hot spots developed by various types of operators in different parts of the world. Business users have a strong need for a worldwide broadband wireless access service. The challenge ahead is to enable these business users to move between these hotspots seamlessly and in a uniform way.

This requirement can be partly solved by inter-WLAN roaming be considered, but the growth of WLAN services and hotspots has created the need for agents to act between WLAN and GSM/GPRS Operators to enable roaming. GSM/GPRS Operators would like to be able to offer global broadband wireless data communication services to their customers today but lack the infrastructure or roaming relations. WeRoam® is able to facilitate both these roaming scenarios.

WeRoam® unites WLAN networks with the GSM network community, allowing subscribers to roam into different WLAN networks and yet have a single identity and receive just one bill.

WeRoam® includes roaming management, (including contracting, clearing and accounting Services), IP/SS7 signalling conversion and secure subscriber and authentication management (Radius and GSM SIM based).



source: TOGEWAnet

8.4 Appendix – Universal Service

8.4.1 Cost of universal service obligations

The costs of universal service obligations within the EU are defined for the member states as the net costs for provisioning of a network and service throughout a specified geographical area:

> *"...the net cost of universal service obligations is to be calculated as the difference between the net cost for a designated undertaking of operating with the universal service obligations and operating without the universal service obligation."* (EU 2002/22)

The calculation and underlying assumptions are specified in more detail in the annex. However taking the effects of network externalities into consideration one can imagine how difficult it is to define a value for the net cost. The responsibility is given from the EU to the national regulatory authority in the member states.

8.4.2 Financing of universal service obligations

Financing or funding of universal service obligations is seen as one of the most difficult issues for regulators (Kennard 1999). The financing was historically based on the cross subsidizing of the long distance or international calls as well as an averaging between rural and urban cost for network provisioning. Under a deregulated environment the market would put pressure on prices significantly above cost. Competition will enter the fields of international calls and network provisioning in urban areas. A whole set of potential funding methodologies is developed and discussed (Kennard1999/ *BERGMAN et al. 1998)*. The methods proposed for collecting the revenues have a wide range:

- General government revenues (taxes)
- Revenues from privatization, licensing and auctions
- Contributions from telecommunication companies
- International settlement payments.

The EU specifies in their Directive not much detail about the method to be chosen by the member states. However they provide the guidelines for the funding methodology:

> *"Member states are to ensure that compensations are undertaken in an objective, transparent, non discriminatory and proportionate manner. This means that the transfer result in the least distortion to competition and to user demand."* (EU 2002/22)

8.4.3 Distribution of universal service support

After the funding for universal service is ensured. It needs to be decided who should be the supplier of those universal services. The topic is discussed in the states as "Distribution of universal service support"(Kennard1999). The methods proposed for distribution range from

- Competitive bidding and auctions
- Grants and Loans as allocation of funds for projects.
- Allocation of funds to Carriers
- Funding for End-Users/Consumers

In the European member states the topic of distributing the universal service support is currently less discussed since this is seen as the task of the incumbent to ensure the universal service obligation on his existing network. However the discussion will get over time a higher priority with the emergence of competition and new services.
As example, the granting of new licences for mobile telephony (UMTS) was based on the ability of providing a nationwide coverage from each bidder.

8.4.4 Affordability of universal service

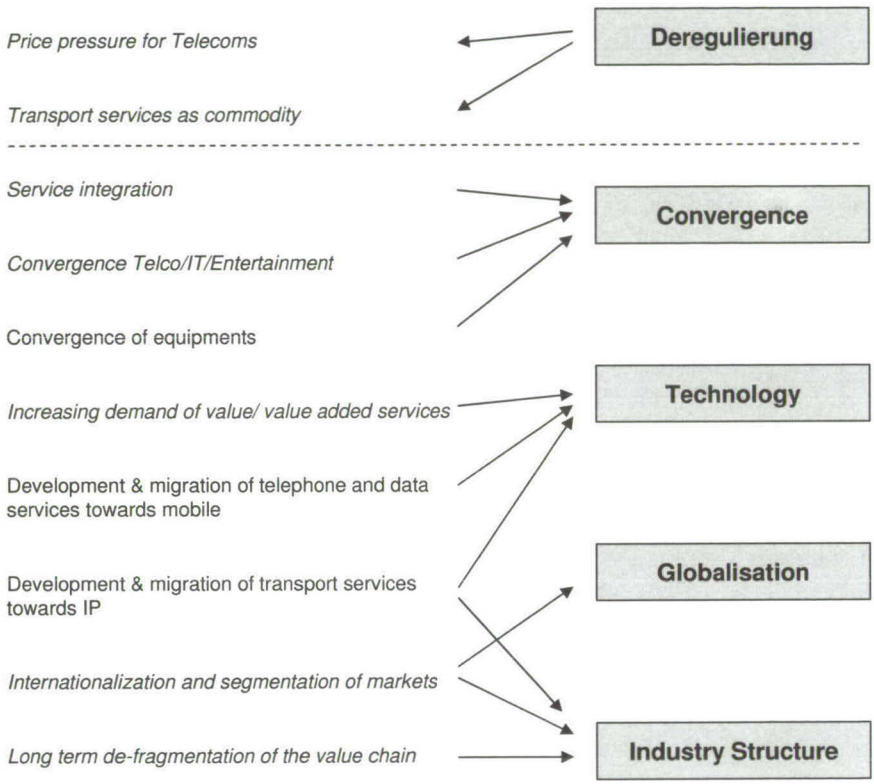
The forth topic with universal service is the question of how far a state economy is able to afford universal services. Especially in the European Union the accession of 13 new countries with less developed economies and network infrastructure raises question about the existing regulatory framework.

> *"The question is not so much whether the price of a subscriber line is affordable to the individual, but rather whether a policy of telephony to everybody is affordable to the country."(EU 2001)*

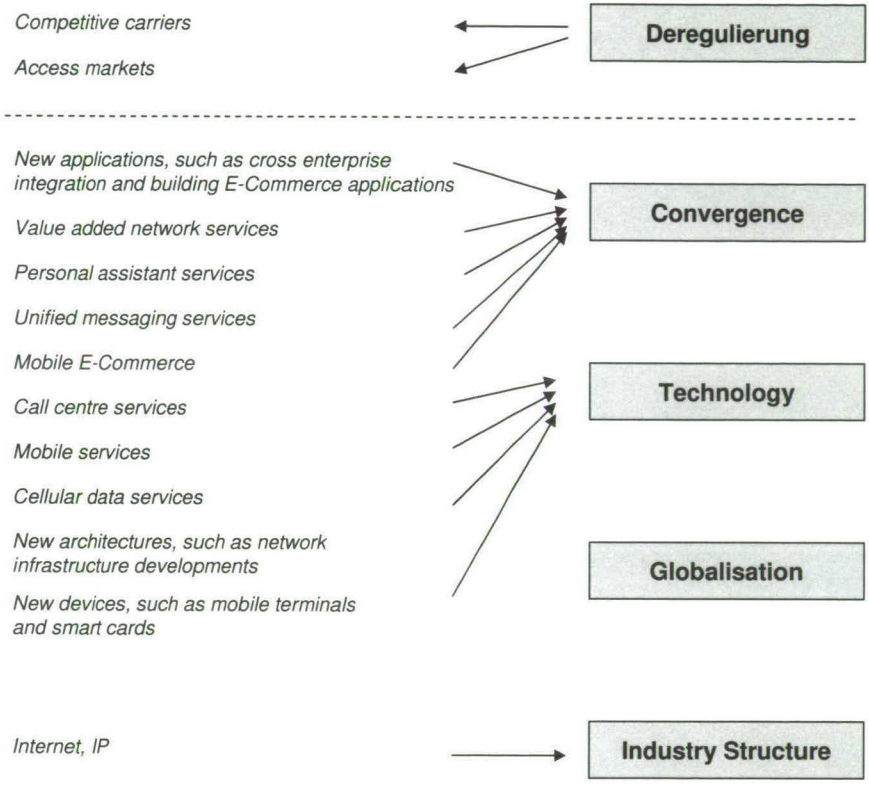
The report recommends for Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Turkey to wait some time before introducing a universal requirement. The burden for the state economy is seen as to high, instead the countries should focus in their deregulation process on implementing a fair and transparent competitive environment. Concurrently they could initiate a tariff rebalancing and carefully designed self-select service packages.

8.5 Appendix- Trends

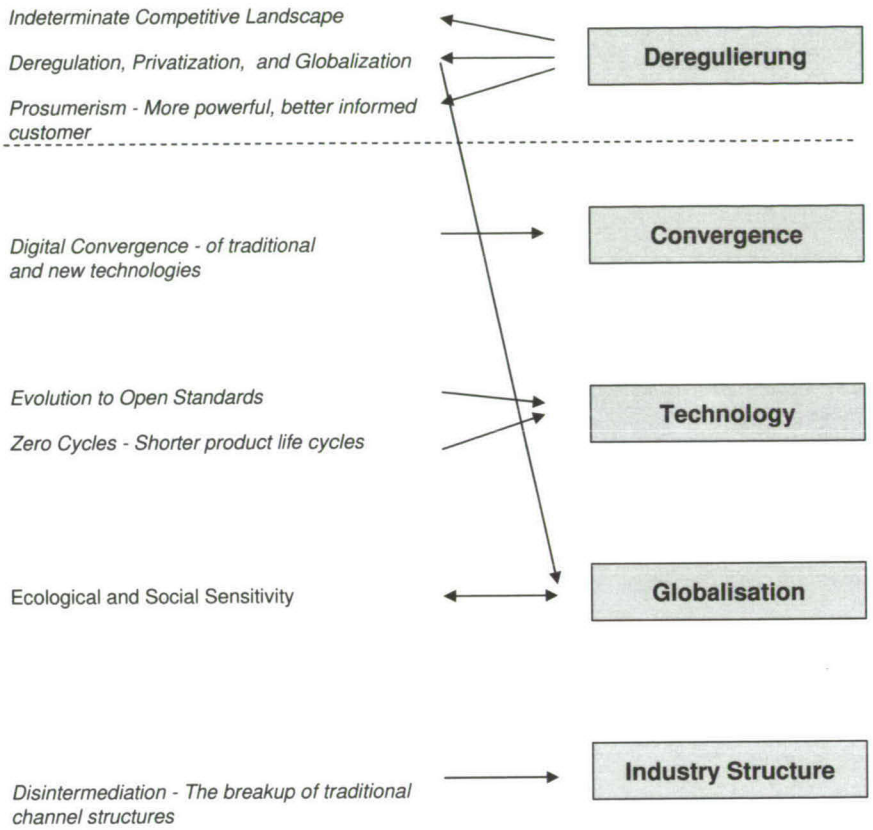
8.5.1 Management Perspective



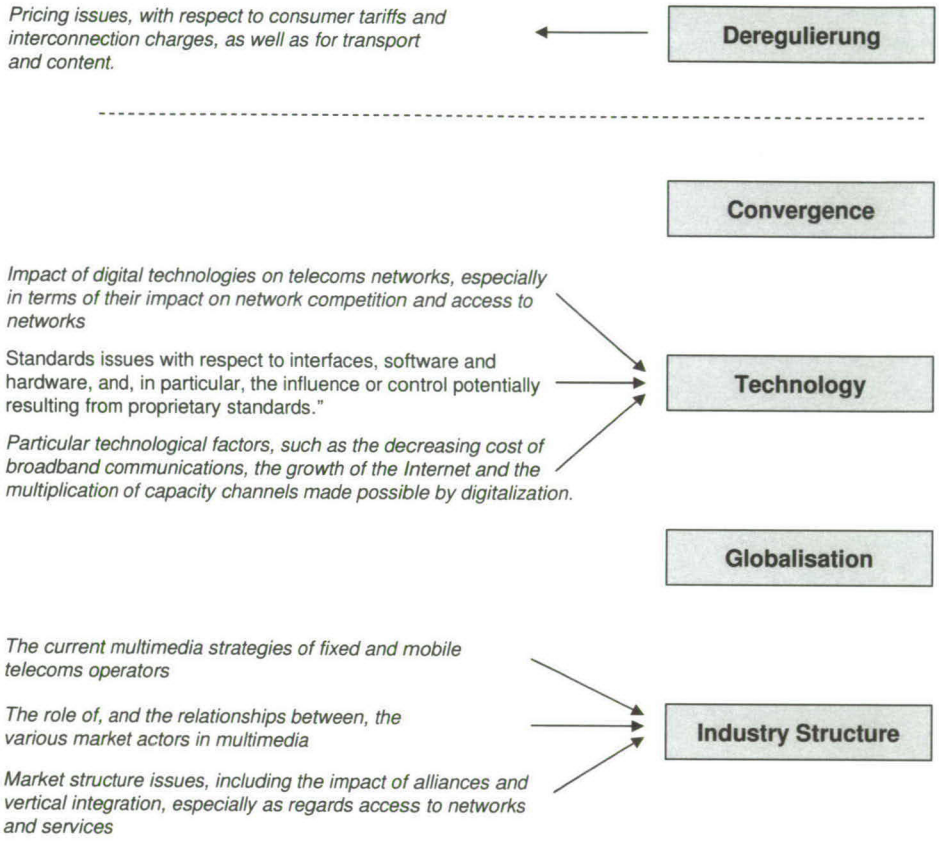
8.5.2 Market Research Institutes



8.5.3 Generic Industry Trends

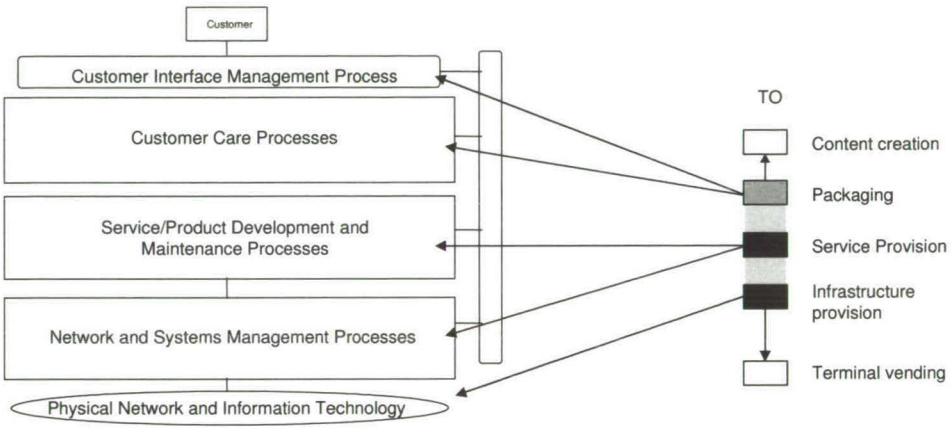


8.5.4 Squire, Sanders & Dempsey



8.6 Appendix – Telecom Operator Map vs. Telecom Operator Value chain

The following figure positions the telecom operator map section 1.2.4 in relation to the telecom operator value chain in section 3.2.2.



8.7 Appendix – Value definitions

Value chain

The terms value chain, value activities and value systems are introduced 1985 into the strategy science by Porter in his book Competitive Advantage. There he provides a statement which will support the further discussion:

> *"Every firm is a collection of activities that are performed to design, produce, market, deliver, and support its product. All these activities can be represented using a value chain."(Porter 1985)*

The concept is extended by Jeffrey Rayport and John J.Sviolka from the physical Value towards virtual value chains which support the ongoing changes towards electronic business. (Rayport 1995)

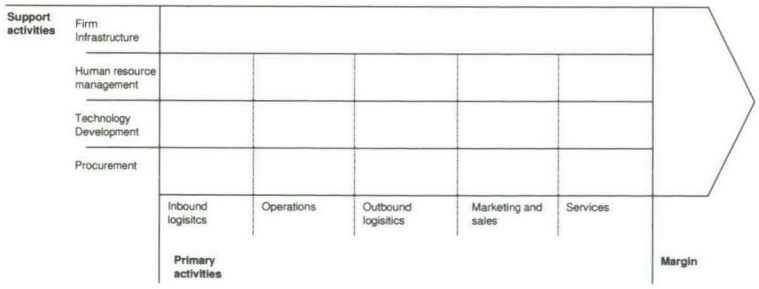
Value activities

Porter differentiates nine generic company value activities. They are grouped into primary and supporting activities.

> *Primary activities: physical creation, marketing, delivery, support and service*
> *Supporting activities : Inputs and Infrastructure that allow primary activities to take place*

The figure shows the nine generic company activities in the value chain:

Figure 61: The value chain



Value chain (Porter 1985)

The virtual value chain concept extends this activity grouping through the activities gather, organize, select, synthesize and distribute.

Value system

The value chain for a company in a particular industry is embedded in a larger stream of activities that I term the "value system" The value system includes the value chains of suppliers, who provide inputs (such as raw material, components, and purchased services) to the company's value chain. The company's product often passes through its channels value chains on its way to the ultimate buyer. Finally, the product becomes a purchased input to the value chains of its buyers, who use it to perform one or more buyer activities. The following exhibit gives an overview of the value system.

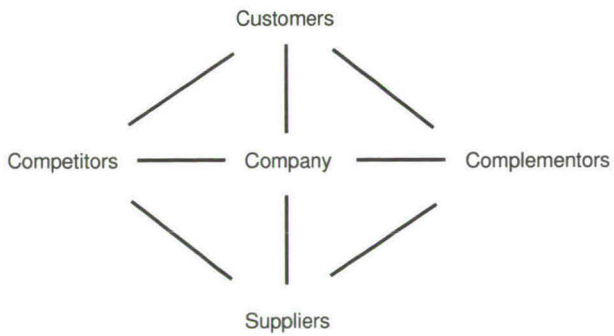
Figure 62: Value system

Value System (Porter 1985:35)

Value network

The concept of value networks is described in Christensen (1997) and Brandenburger and Nalebuff (1998) . Both use the term from a firm perspective. Christensen describes it as *"the context within which a firm identifies and responds to customer´ needs, solves problems, procures input, reacts to competitors, and strives for profit".* Brandenburger and Nalebuff introduce a graphical representation which is shown in the Exhibition below.

Figure 63: Value Network



Value Network (Brandenburger Nealebuff 1988:17)

A different definition is provided by Weiner/Nohria/Hickman and Smith. (Weiner 1997) They see a value network as a whole new value chain where one company exploits the strengths of each value provider and co-ordinates production and delivery across companies. This definition is in the literature also applied as market maker. I will concentrate on the Christensen and Brandenburg and Nalebuff definition.

Economic web

A new term developing is the economic web, in addition to the technology web. I will base the usage of "economic web" on the definition provides from Hagel and Singer

"Economic webs create market incentives to mobilize a much larger and more diverse group of companies than joint ventures or alliances, with their cumbersome legal arrangements, could hope to mobilize. The companies in a web act independently in response to these economic incentives but reinforce each other by adding value the overall web, both for customers and for web participants." (Hagel 1999:136).

Network of industries

The "network of industries" is described by Henry Mintzberg (1998:85) in the context of locating the core business for generic business strategies. He states: *"A business can be thought to exist at a junction in a network of industries that take raw materials and through selling to and buying from each other produce various finished products (or services). "*

Activity system

Michael E.Porter provides in "What is strategy" an approach for strategy formulation based on the fit of individual activities within a firms value chain. In this paper he focuses on activities with the argument: *"Activities, then, are the basic units of competitive advantage." (Porter 1996)*

Day provides a definition for the direction from a firm perspective as *"Activities: the appropriate scale and scope of activities to be performed"*(Day 1990:6).
Porter is mapping the firm's activities in an Activity-system map. Again this approach is done from a corporate perspective.

8.8 Appendix - Uncertainty

Decision making is one of the elementary tasks of top management in today's business. For optimal resource allocation managers like economists would like to reduce or eliminate uncertainty factors. The development from a regulated national oriented industry organisation to the global multimedia industry lacks historical experience and therefore contains several factors which are to a high degree uncertain.
Having limited knowledge and high uncertainty in the industry environment is a situation which has challenged economists over the last century with different perspectives. One of the first economist discussing the problem was Frank Knight in his book "Risk, Uncertainty and Profit " (Knight 1921).

> *The facts of life in this regard are in a superficial sense obtrusively obvious and are a matter of common observation. It is a world of change in which we live, and a world of uncertainty. We live only by knowing something about the future; while the problems of life or of conduct at least, arise from the fact that we know so little. This is as true of business as of other spheres of activity. (Knight 1921)*

The nature of the problem did not change over time. The statement of Knight is similar to what Samuelson states decades later about the uncertainty in business.

> *Economic activity often raises complexities that are not captured in our elementary theories. One topic called the economics of uncertainty, analyzes the impact of many uncertainties involved in economic life. (Samuelson 2001:203)*

An early economic definition of uncertainty was established by Frank Knight. He differentiates between the terms "uncertainty" and "risk" regarding the unknown elements of business.

> *To preserve the distinction which has been drawn in the last chapter between the measurable uncertainty and an unmeasurable one we may use the term "risk" to designate the former and the term "uncertainty" for the latter. (Knight 1921)*

This distinction between measurable and unmeasurable is an important difference handling the given uncertainty of a problem.
The early discussions of uncertainty still lacked the integration into economic models. The official integration of risk and uncertainty into economic theory was done two decades later, when von Neumann and Morgenstern developed the

definition of the expected utility* function (Neumann1944). The expected utility functions laid the foundation for decision making under risk. The expected utility function was a model developing the utility function further integrating the uncertainties existing about the precise nature of agent's preferences.

Since then economic theory has evolved and behavioral science further and a wide range of contributions to the topic have been made to handle the uncertainty in economics. The psychologist Kahnenman received the 2002 Nobel price in economics for the research on the enhancement of the expected utility theory. (Kahnenman 1979) The official reasoning from the Nobel committee was:

> *"...for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty." (Nobel Foundation 2002)*

The importance of the uncertainty in economics is growing with the understanding of the underlying decision criteria's and imperfections in traditional models.

Even if we have strong economic models for handling a large portion of the uncertainty, reality will leave some residuals in those models. What becomes clear in all discussions is that we will not be able to eliminate uncertainty. It is rather the other way around that change and complexity is increasing in speed and we will not be able to understand all factors of the complex reality. The task in today's business is to understand the nature of the uncertainty and learn to manage it.

The managerial need led to the development of applications for handling the uncertainties in decision making. This whole line of research about uncertainty, probabilities and human judgment led to the development of applications in empirical work.

> *"Modern economics has developed useful tools to incorporate uncertainty into the analysis of business and household behavior and of financial markets." (Samuleson 2001:204)*

Managers and consultants today have a set of analytical tools which can be applied in uncertain economic situations. Known analytical tools for managing uncertainty are treated under the topics "Game Theory", "Real Options" and "Simulation".

In the next section I will look at those tools and provide some additional input on how uncertainty is discussed in the managerial literature where the existence of uncertainty is seen as a fact which has to be integrated.

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* **Expected utility (von Neumann-Morgenstern utility):** An axiomatic extension of the ordinal concept of utility to uncertain payoffs. An agent possesses a von Neumann-Morgenstern utility function if she ranks uncertain payoffs according to (higher) expected value of her utility of the individual outcomes that may occur. (http://www.sfb504.uni-mannheim.de/glossary/utility.htm)

9 Bibliography

American Gas Foundation (2000)
http://www.fuelingthefuture.org/contents/NaturalGasPowersUp.asp
Accessed 29.09.2003

Ansoff, Igor H. (1965); Corporate Strategy: An Analytic Approach to Business Policy for Growth and Expansion. New York: McGraw-Hill

AT&T (2003); http://www.att.com/history/history1.html accessed 15.02.2003

Bailey, Elisabeth E.(1997); Integrating Policy Trends into dynamic advantage. In George S.Day, David J.Reibstein and Robert E.Gunther, Wharton on Dynamic Competitive Strategy. New York: John Wiley & Sons, Inc. PP 76-98

Bailey, Elizabeth E. & Baumol, William J. (1984); Deregulation and the Theory of Contestable Markets, Yale Journal of Regulation Vol 1:111,1984 pp111-137

Bailey, Elizabeth E. & Panzar John C. (1981); The Contestability of Airline Markets During the Transition to Deregulation, Journal of Law and Contemporary Problems, 44:1, Winter,1981, PP 125-45

Bakhshi, Shiv K. (1996); Network Alliances Among Telecommunication Operators and European Liberalization: A Structured-Based Analysis. Ann Arbor:UMI

Bane, Williams P., Bradley Stephen P. & Collis David J. (1998); The Converging Worlds of Telecommunication, Computing and Entertainment in Sense & Respond Bradley/Nolan

Bangemann, Dr. Martin (1997); A New World Order for Global Communication: The need for an international Charter EU Ref.: Speech /97/170 Date 8/9/97

Barnaby, Simpson (1999); Arthur D.Little, E-Business in the TIME Industry. www.adl.com accessed 13.8.1999

Bartlett Christopher A. & Ghoshal, Sumantra (1998); Managing Across Borders : the transnational solution. Boston : Harvard Business School Press

Baumol W.J., Panzar J.C. & Willig R.D. (1982); Contestable Markets and the Theory of Industry Structure. New York: Harcourt Brace Jovanic

Bell, Tom W. & Singleton, Solveig (1998); Regulators Revenge. The Future of Telecommunications Deregulation. Washington, D.C.: Cato

Benton Foundation (1996); The Telecommunication Act of 1996 and the Changing Communication Landscape. Congressional Conference Report to Accompany Telecommunications Act of 1996 (//http://www.benton.org/Library/Landscape/landscape.html); Accessed 05.12.2003

Bergman Lars, Doyle Chris, Gual Jordi, Hultkrantz Lars, Neven Damien, Röller Lars-Hendrik, Waverman Leonard & Vaitilingam Romesh (1998); Europe´s network industries: Conflicting Priorities : Telecommunications Monitoring European Deregulation, Centre for Economic Policy Research,. London: CEPR

Bock, Friedrich, Hellweg, Martin, Lube, Marc-Milo & Mülhäuser, Hubertus (1998); A Strategy for supporting Innovation and Growth in Times of High Uncertainty. Prism (Arthur D.Little) Third Quarter 1998 p.26

Boyd, Charles (2003); Southwest Missouri State University/ http://www.mgt.smsu.edu/mgt487/mgtissue/newstrat/metcalfe.htm Accessed 27.5.2003

Brandenburger, Adam M. & Nalebuff, Barry J. (1998); Co-opetition. Paperback Edition, New York: Doubleday

Brandenburger, Adam M. & Nalebuff, Barry J. (1995); The Right Game: Use Game Theory to shape Strategy. Harvard Business Review, July-August 1995

British Telecom (2003); http://www.btplc.com/ accessed 21.5.2003

Brock, G.W. (1981); The Telecommunications Industry: The Dynamics of Market Structure. Cambridge:Harvard University Press

Brown, Stanley A. (2000); Customer relationship management : a strategic imperative in the world of e-business. Etobicoke: John Wiley and Sons Canada,Ltd

Brown, Shona L. & Eisenhardt, Kathleen M. (1998); Competing on the edge: strategy as structured chaos. Boston: Harvard Business School Press

BT Group (2002); Annual Report and Form 20-F http://www.btplc.com/InvestorCentre/index.htm accessed 10.07.2003

Bundesamt für Statistik (2003); http://www.statistik.admin.ch/stat_ch/ber00/dkan_ch.htm accessed 22.5.2003

Campbell Andrew, Goold Michael, Alexander Markus (1995); Corporate Strategy: The Quest for Parenting Advantage, Harvard Business Review, March-April 1995

Christensen, Clayton M., (1997); The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. Boston: Harvard Business School Press

Clemons, Eric K.& Bradley, Stephen P. (1998); Strategic Uncertainty and the Future of Online Consumer Interaction. In Stephen P. Bradley and Richard L.Nolan, Sense & Respond: Capturing value in the network era.. Boston: Harvard Business School Press PP 85-106

Coase, R.H. (1990); The Firm, the market and the law. Chicago: The University of Chicago Press

Coase, R.H. (1990); The Problem of social cost. In "The Firm, the market and the law", Chicago: The University of Chicago Press (1990); PP 95-156

Coase, R.H. (1990); The Nature of the Firm. In "The Firm, the market and the law", Chicago: The University of Chicago Press (1990); PP 33-57

Cooper, Robert G., Edgett, Scott J., Kleinschmidt Elko J. (1998); Portfolio Management for New Products. Massachusetts: Perseus Books

Courtney, Hugh, Kirkland, Jane & Viguerie, Patrick (1997); Strategy under uncertainty, Harvard Business Review, November-December 1997

Coyne, Kevin P. & Dye, Renée (1998); The Competitive Dynamics of Network-Based Business, Harvard Business Review January- February 1998 pp 99-109

Cronin, Mary J. (2000); Unchained Value: The New Logic of Digital Business. Boston: Harvard Business School Press

Curry, Jay & Curry, Adam (2000); The Customer Marketing Method : how to implement and profit from customer relationship management. New York: The Free Press

Dataquest (2001); WWW.Dataquest.com accessed 15.03.2001

Day, George S. (1990); Market Drive Strategy: Processes for Creating Value, New York: The Free Press

Debitel (2003); http://www.debitel.de/ir_de/berichte_content/geschaeftsberichte/index.php accessed 12.02.2003

Downes, Larry & Mui, Chunka (1998); Unleashing the Killer App: Digital Strategies for Market Dominance New York: Harvard Business School Press

Eisenhardt, Kathleen M.& Brown Shona L.(1998); Time Pacing: Competing in Markets That Won´t Stand Still, Harvard Business Review March-April 1998

Esser, Josef (1997); Infrastruktur im Umbruch: Schlussfolgerungen und offene Fragen. In Europäische Telekommunikation im Zeitalter der Deregulierung: Infrastruktur im Umbruch; Josef Esser, Boy Lüthje and Ronald Noppe (Hrsg.) 1997. Münster: Verlag Westfälisches Dampfboot PP206-212

EU (1973); Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits and

EU (1987); Grünbuch über die Entwicklung des gemeinsamen Marktes für Telekommunikationsdienstleistungen und Telekommunikationsendgeräte, p. 2 KOM (87); 290 endg. Brüssel, den 30. Juni 1987 ,

EU (1987); (Engl.: COM (87); 290 final, 30.07.1987 Towards a dynamic European economy: Green Paper on the development of the common market for telecommunication services and equipment);

EU (1989); Council Directive 83/189/EEC of 28 March1983 laying down a procedure for the provision of information in the field of technical standards and regulations

EU (1996); European Commission communication; Services of general interest in Europe, QJ C281, 26 September 1996

EU (1996/92); Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market in electricity

EU (1997/66); Directive 97/66/EC of the European Parliament and of the council of 15 December 1997 concerning the processing of personal data and the protection of privacy in the telecommunication sector

EU (Com (97)623); Green Paper on the Convergence of the Telecommunications, Media and Information Technology sectors, and the Implications for Regulation - Towards an Information Society Approach, European Commission , Brussels, 3 December 1997, Com (97)623

EU (1997/13); Directive 97/13/EC of the European Parliament and of the Council of 10 April 1997 on a common framework for general authorizations and individual licences in the field of telecommunications services

EU (1997); Com(97):623 P.2

EU (Jan1998); Status Report on EU telecommunication policy Update: January 1998

EU (1998); Regulatory Package http://europa.eu.int/information_society/topics/telecoms/regulatory/98_regpack/index_en.htm (Accessed 14.5.2003);

EU (1999/539); Towards a new framework for Electronic Communication infrastructure and associated services, The 1999 Communication Review COM (1999); 539

EU (2000/393); Directive of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, Brussels 12.7.2000, Com(2000); 393 final

EU (2001); Study on Universal service in the accession countries, Executive Summary June 30,2001 produced for the European Commission under Study contract no 71080 by Cullen International SA and Wissenschaftliches Institut für Kommunikationsdienste GmbH

EU (2002) SS&D; Market Definitions for Regulatory Obligations in Communications Markets, A Study for the European Commission, Squire, Sanders & Dempsey L.L.P. May 2002

EU (2002/22); Directive 2002/22/EC Of the European Parliament and of the Council of 7 March 2002, on universal service and users´ rights relating to electronic communications networks and services (Universal Service Directive); Article 1

EU (2003); European Commission Home Page http://europa.eu.int/information_society/topics/telecoms/implementation/missionstatement/index_en.htm (Accessed 14.5.2003);

Evans, Philip B.& Wurster, Thomas S. (1997); Strategy and the New Economics of Information, Harvard Business Review, September-October 1997

Fahey, Liam (1998); Industry Scenarios. In Liam Fahey and Robert M.Randall, Learning from the Future: Competitive Foresight Scenarios. New York: John Wiley & Sons, Inc. pp189-222

Feyerabend, Dr. Ing.E.H. Ernst, Heidecker Dr. Rer. Pol. Hugo, Breisig Prof. Dr. Phil. Franz & Kruckow August (1929); Handwörterbuch des elektrischen Fernmerldewesens. Berlin: Verlag von Julius Springer

Fischer & Lorenz (2000) Internet and the Future Policy Framework for Telecommunications, A report for the European Commission. Fischer & Lorenz (2000);

Forrester (2001) WWW.Forrester.com accessed 15.03.2001

Fredebeul-Krein, Markus & Freytag Andreas (1997); Telecommunications and WTO discipline: An assessment of the WTO agreement on telecommunication service; Telecommunication Policy,Vol.21, No 6 pp 477-491

Gartner (2001) WWW.Gartner.com accessed 15.03.2001

Geus, Arie de (1997); The Living Company. Boston: Harvard Business School Press

Gilder (2003); Source for publishing Metcalfe's Law. In searchNetworking.com http://searchnetworking.techtarget.com/sDefinition/0,,sid7_gci214115,00.html accessed 27.5.2003

Gillick, D (1992); Telecommunication policies and regulatory structure: New issues and trends. Telecommunication Policy, December 1992, pp 726-737

Gilmore, James H. & Pine II, Joseph B. (2000); Markets of One: creating customer unique value through mass customization. Boston: Harvard Business School Press

Gottlieb Duttweiler Institut für Trends und Zukunftgestaltung, (1998); GDI_Szenarien 2010, Rüschlikon/Zürich: Gottlieb Duttweiler Institut

Grant Robert M., (1998); Contemporary Strategy Analysis : Concepts, Techniques. Massachusetts: Blackwell Publishers Inc.

Grove Andrew S. & Burgelman, Robert A.(1996); Strategic Dissonance, California Management Review Volume 38, Number2, Winter 1996 pp 8-28

Günther, Dr. Johann (1992); Telekommunikation in Österreich. Wien : Literas Universitätsverlag

Häcki Remo & Lighton Julian (2001); The future of the networked company, McKinsey Quarterly 2001 Vol 3 pp 26-40

Hagel III, John & Singer, Marc (1999); Net Worth: Shaping markets when customers make the rules. Boston: Harvard Business School Press

Hagel III, John & Singer, Marc (1999); Unbundling the Corporation, Harvard Business Review, March April 1999 pp 133-141

Hahn, Robert W. & Guasch, Luis J. T (1999); The Cost and Benefits of Regulation: Implications for Developing Countries. The World Bank Observer, vol 14 no.1 pp137-158

Hamel, Gary & Prahalad, C.K. (1994); Competing for the Future, Harvard Business Review July-August 1994

Hamel, Gary & Prahalad, C.K. (1989); Strategic Intent, Harvard Business Review May-June 1989, pp63-76

Hanson Ronald W. (1992); Regulation vs. Deregulation: The case of Medical Technologies, Economic Directions Vol.2 Number 2

Harvard Business Review (1999); Harvard Business Review on Managing Uncertainty. Boston: Harvard Business School Press

Hazlett, Thomas W. (2000); Economics and Political Consequences of the 1996 Telecommunications Act, Regulation, Volume 23 No.3

Heijden, Kees van der (1996); Scenarios: The Art of Strategic Conversation. Chichester: John Wiley & Sons Ltd.

Henten, Anders, Rohan, Samarajiva & Melody William H. (2003); Designing Next Generation Telecom Regulation: ICT Convergence or Multisector Utility; The World Dialogue on Regulation for Network Economies http://www.regulateonline.org/2002/dp/dp0206.htm accessed 1.2.2003

Hundt Reed E. (1996); Testimony before the Subcommittee on Telecommunications and Finance Committee on Commerce, U.S. House of Representatives July 18, 1996

Hyman, L.S., Toole, R.C., and Avellis, R.M. (1987); The New Telecommunications Industry: Evolution and Organization. Public Utility Reports, Vol. 1.

IDC (2001); IDC Research: Internet User Trends in China

IDC (2002); IDC: European Telecommunication Services – Monitoring European Telecom Operators: Final Report January 2002 - For the European Commission

IEC (2002); The Globalization of Interconnection: Tutorial. http://www.iec.org accessed 2.3.2003

ITU (1997); ITU releases report on telecoms regulation in an era of transition http://www.itu.int/home/index.html accessed 3.02.2003

ITU (1999); http://www.itu.int/ITU-D/ict/publications/dot/1999/page1_dot.html

ITU (2001); http://www.itu.int/ITU-D/ict/statistics/at_glance/KeyTelecom99.html (accessed 18.02.2003);

ITU (2003); International Telecommunication Union http://www.itu.int/cgi-bin/htsh/mm/scripts/mm.list?_search=ITUstates Accessed 21.5.2003

ITU (2003); ITU Home Page http://www.itu.int/aboutitu/overview/purposes.html (3.02.2003);

Kahn, Alfred E. (1998); Resisting the Temptation to Micromanage: Lessons from Airlines and Trucking. In Regulators´ Revenge: the future of telecommunications deregulation edited by Tom W.Bell and Solveig Singleton. Washington D.C. :Cato Institute pp 17-28

Kahnenman, Daniel & Tversky, Amos (1979); Prospect Theory: An Analysis for Decisions under Risk, Econometrica. Volume 47 Issue 2 pp 263-91

Kaplan, Robert S.& Norton, David P.(1996); The Balanced Scorecard :Translating Strategy into Action Boston: Harvard Business School Press

Kelly, Tom (2000); The Art of Innovation: Lessons in creativity from IDEO, America´s leading Design Firm. New York: Doubleday

Kennard William E. (1999); Connecting the Globe: A Regulator's Guide to Building a Global Information Community FEDERAL COMMUNICATIONS COMMISSION (1999); http://www.fcc.gov/connectglobe/sec6.html Accessed 2.6.2003

Kerf, Michel, Schiffler, Manuel & Torres Clemenica (2001); Telecom Regulators, Public Policy for the private sector, Note Number 230, May 2001 (www.worldbank.org);

Knight, Frank H. (1921); Risk, Uncertainty, and Profit. Boston, MA: Hart, Schaffner & Marx Houghton Mifflin Company, 1921. [Online] available from http://www.econlib.org/library/Knight/knRUP7.html accessed 19 March 2003

Lawyer Gail (1998); tele.com, February 1998, pp 64-66

Laffont, Jean-Jaques & Tirole Jean (2000); Competition in Telecommunications. Cambridge : The MIT Press

Laffont, Jean-Jaques, Tirole Jean & Rey, Patrick (2000); Multiple Bottlenecks and two-way Access. In Jean-Jaques Laffont and Jean Tirole, Competition in Telecommunications. Cambridge : The MIT Press pp179-216

Leslie, Keith, Kausman David, Bard Gustav (1999) European Power: Managing through deregulation, The McKinsey Quarterly 1999 Number 1, pp 38-51

Level3 (1998); Level 3 Annual Report 1998 http://www.level3.com/730.html accessed 15.3.2003

Loderer, Claudio, Jörg, Petra, Pichler, Karl, Roth, Likas & Zgraggen, Pius (2002); Handbuch der Bewertung Zürich: NZZ Verlag 2000

Longstaff P.H. (2001); New Ways to Think About the Visions called "Convergence": A Guide for Business and Public Policy. Publication Center of Information Policy Research Harvard University

Lüthje Boy (1997); Transnationale Dimensionen der "network revolution". In Europäische Telekommunikation im Zeitalter der Deregulierung: Infrastruktur im Umbruch, Josef Esser/Boy Lüthje/Ronald Noppe (Hrsg.) 1997. Münster: Verlag Westfälisches Dampfboot PP36-77

Malone, Thomas & Laubacher, Robert J. (1998); The Dawn of the E-Lance Economy, Harvard Business Review September- October 1998

McKinsey Quarterly (2003); http://www.mckinseyquarterly.com/home.asp?tk=mfladung:: accessed on March 12,2003

Melody William H., Henten Anders & Samarajiva Rohan (2003); Designing Next Generation Telecom Regulation: ICT Convergence and Multisector Utility? January 2003 The World Dialogue on Regulation for Network economies (WDR);

Mensdorff-Poilly, Heinrich (1997); Das Kabelfernsehen in Österreich, Vom Programmanbieter zum Multimedia- Telekommunikationsmedium. In Achim Kaspar und Paul Rübig Telekommunikation : Herausforderung für Österreich. pp 253-264

Meriam-Webster (2003); Meriam-Webster Online Dictionary http://www.m-w.com/home.htm Accessed 21.5.2003

Mintzberg Henry, (1998); Generic Corporate Strategies. In Henry Mintzberg and James Brian Quinn, Readings in the Strategy Process. Englewood Cliffs: Prentice Hall pp347-358

Moore, Geoffrey A., (1999); Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers New York: Harper Collins Publisher Inc.

Navarro, Peter (1996); Electric Utilities: The Argument for Radical Deregulation. Harvard Business Review January- February 1996

Neumann J. von & O.Morgenstern (1944); Theory of Games and Economic Behaviour. 1953 edition, Princeton, NJ: Princeton University Press.

NMF (1998); Network Management Forum: Telecom Operations Map, April 1998

Nobel Foundation (2002); The Official Web Side of The Nobel Foundation (Accessed 11.6.2003) http://www.nobel.se/economics/laureates/2002/index.html

Nokia (2003);

http://www.nokia.de/nokia/generator/Sites/www.nokia.de/Mobiltelefone/Modelluebersicht/3650/Zubehoer/Cover/Zubehoer__Cover,version=2.html accessed 24.05.03

OECD (1997); See Webcasting and Convergence : Policy implications. OECD, DSTI/ICCP/TISP(97)6 - to be published December 1997

OECD (1999); Open Markets Matter: The Benefits of Trade and Investment Liberalisation, Policy Brief October 1999

Ovum (2001); www.Ovum.com accessed 15.03.2001

Peppers, Don, Rogers, Martha & Dorf, Bob (1999); The One to One Fieldbook: The complete toolkit for implementing a 1 to 1 marketing program. New York: Bantam Doubleday Dell Publishing Group Inc.

Pigou, A.C.(1952); The Economics of Welfare, 5th ed. London: Macmillian&Co.

Porter, Michael E. (1980); Competitive Strategy. New York: The Free Press

Porter, Michael E. (1986); Changing Patterns of international Competition, California Management Review, Vol.28, No.2 Winter 1986 pp.9-40

Porter, Michael E. (1985); Competitive Advantage: creating and sustaining superior performance. New York: The Free Press

Porter, Michael E. (1996); What is Strategy? Harvard Business Review November-December 1996, pp61- 78

Porter, Michael,E. (1987); From Competitive Advantage to Corporate Strategy, Harvard Business Review May-June 1987 pp43-59

Posner, Richard A (1999); Encyclopaedia of Law and Economics, http://encyclo.findlaw.com/foreword.html accessed 20.03.2003

Prahalad, C.K. & Oosterveld, Jan P. (1999); "Transforming Internal Governance: The Challenge for Multinationals", Sloan Management Journal, Volume 40, Number 3, Spring, 1999

Quelch, John A. & Hoff Edward J. (1986); Customizing Global Marketing, Harvard Business Review May-June 1986

Rayport, Jeffrey F. & Sviolka, John J. (1995); Exploiting the Virtual Value Chain, Harvard Business Review, Nov.-Dec.1995

Ringland, Gill (1998); Scenario Planning, Managing for the Future. Chichester: John Wiley & Sons Ltd

Samuelson, Paul A.(2001); Uncertainty and Game Theory. In Economics 17th ed. New York: Mc Graw Hill

Samuelson, Paul A. & Nordhaus, William D. (2001); Economics 17th ed. New York: Mc Graw Hill

Schwartz, Peter (1996); The Art of the Long View, Paperback Edition, New York: Bantam Doubleday Dell Publishing Group, Inc.

Seaberg, James G., Hawn, Jeff, E.Dincerler, Gotekin, Eugster, Christopher C.& Rao Nagendra L.(1997); Attackers versus incumbents: The battle for value in an IP-networked world, The McKinsey Quarterly 1997 Number 4 pp145-146,

Senge. Peter M. (1990); The Fifth Discipline : The Art and Practice of the learning Organization. New York: Bantam Doubleday Dell Publishing Group, Inc.

Shapiro. Carl & Varian, Hal R. (1999); Information Rules: A strategic guide to the network economy. Boston: Harvard Business School Press

Shy Oz (2001); The economics of networks industries. Cambridge: Cambridge University Press

Sirower Mark (2003); Comment: When mergers can be a scandal; Financial Times; Aug 14,2003

Sloan School of Management (1997); Working Paper "Two Scenarios for 21st Century Organisations: Shifting Networks of Small Firms or All-Encompassing "Virtual Countries", http://ccs.mit.edu/21c/21CWP001.html

Smith, Adam. (1789); An Inquiry into the Nature and Causes of the Wealth of Nations. Library of Economics and Liberty. Retrieved January 23, 2003 from the World Wide Web: http://www.econlib.org/library/Smith/smWN1.html

Southwest Missouri State University (2003); http://www.mgt.smsu.edu/mgt487/mgtissue/newstrat/metcalfe.htm Accessed 27.5.2003

Spiech Daniel (1999); Die Südostschweiz, Millenium S.26

Squire,Sanders & Dempsey, Analysys (1998); Study on Adapting the EU Regulatory Framework to the Developing Multimedia Environment; Squire,Sanders & Dempsey, Analysys, Brussels 1998

Stigler George J.(2003) Monopoly in The Concise Encyclopedia of Economics (Web Edition http://www.econlib.org/Enc/Monopoly.html) accessed 25.02.03

Stigler, George J.. (1982); Nobel Lecture: The Process and Progress of Economics. Journal of Political Economy, 1983, vol 9issue 4 pages 529-45

Stiglitz Joseph E. (2001); Information and the Change in the Paradigm in Economics, Price Lecture December 8,200 P.521

Stratil – Weissenburger (1997); TKG Telekommunikationsgesetz, Wien: Manz 1997, p2

Swiss PTT (1996); Swiss Postal Services and Swiss Telecom (Jetzt Swisscom AG); Annual Report 1996, Your new PTT:

Swisscom (1997); Swisscom Annual Report 1997

Swisscom (2003); www.swisscom.ch/pr/content/history/ accessed 21.04.2003

Swisscom (8/2003); www.swisscom.com/pr/content/profile/index_EN.html accessed 25.08.2003

Syz (1997); 1987-1997 Die Story der PTT Reform; Der Weg vom Staatsbetrieb zu zwei selbständigen Kommunikationsunternehmen im Wettbewerb; Hrsg. Dieter Syz Präsident der Generaldirektion PTT verfasst von Jean Odermatt; Bern, Dezember 1997

Tapscott, Don, Ticoll, David & Lowry Alex (2000); Digital Capital: Harnessing the Power of Business Webs. Boston: Harvard Business School Press

Tapscott, Don (1996); The Digital Economy: Promise and Peril in the Age of Networked intelligence. New York: McGraw-Hill

Taylor, William E., Taylor Lester D.(1993) Postdivestiture Long-Distance Competition in the United States, AEA Papers and Proceedings, May1993 PP 185- 1990

Telecom-Control-Kommission (2001); http://www.rtr.at/web.nsf/deutsch/Ueber+Uns_TKK_Aufgaben accessed 14.5.2001

Telefonmuseum-Hittfeld (2003); http://www.telefonmuseum-hittfeld.de/ accessed 24.3.2003

The History of Economic Thought (2003); http://cepa.newschool.edu/het/schools/chicago.htm accessed 23.1.2003

The Wall Street Journal Europe (2000); Vodafone, Mannesmann Reach a Deal, February 4-5,2000 p4,

Thierer, Adam D. (1994); Unnatural Monopoly: Critical Moments in the Development of the Bell System Monopoly, The Cato Journal, Volume 14 Number 2 Fall 1994

TKG (1997); Bundesgesetz betreffend die Telekommunikation (Telekommunikationsgesetz -TKG); Österreich, BGBI I 1997/100

TOGEWAnet (2003); http://www.togewanet.ch/services/index.htm Accessed 28.5.2003

USPTO (1876); U.S.: Patent No.174,465: Alexander Graham Bell, Improvement in Telegraphy March 1876. www.uspto.gov Accessed 21.5.2003

Vodafone (2003); http://www.vodafone.com/ accessed18.2.2003

Wack, Pierre (1985); Scenarios: Uncharted Waters Ahead. Harvard Business Review September-October 1985 PP 73-89

Wack,Pierre (1985); Scenarios: Shooting the Rapids ,Harvard Business Review , November-December 1985 pp 139-150

Weiner, Michael, Nohria, Nitin , Hickman, Amanda & Smith Huard (1997); Value Networks - The Future of the U.S.Electric Utility Industry, Sloan Management Review Summer 1997

Weston, Fred J., Kwang, S.Chung & Susan, E.Hoag (1990); Mergers, Restructuring and Corporate Control. Englewood Cliffs: Prentice Hall

White, Lawrence J. (2000); US telephone deregulation: lessons to be learned mistakes to be avoided In "Japan and the World Economy" 12(2000) 173-183 Elsevier Science

Williamson Oliver E.(1973) Markets and hierarchies: Some elementary considerations. The American Economic Review (1973) 63,316-325

Wilson, Ian (1998); Mental Maps of the Future: An Intuitive Logics Approach to Scenarios. In Liam, Fahey and Robert M.Randall Learning from the Future: Competitive Foresight Scenarios. New York: John Wiley & Sons, Inc. pp 81-108

WTO (1998); WTO Telecoms Deal will Ring in the changes on 5 February 1998, Press/87 26 January 1998 http://www.wto.org/press/press87.htm accessed 20.7.1999

WTO (2003); www.wto.org/home accessed 20.02.2003

Yip George S. (1992); Total global strategy: managing for worldwide competitive advantage. Englewood Cliffs: Prentice Hall

Yoffie, David B. & Kwak, Mary (2001); Playing the rules: How Intel avoids antitrust Litigation, Harvard Business Review, June 2001 pp 119-122

International Corporate Strategy in Network Based Industries

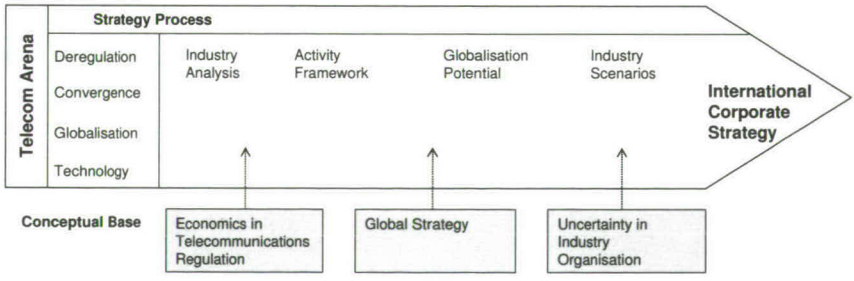
Een onderzoek naar de opkomende multimedia-industrie

De huidige trend met betrekking tot deregulering resulteert in een hoge mate van onzekerheid voor toekomstige organisaties binnen „netwerk based industries". De integratie van de kennis van de industrie met de theoretische concepten draagt ertoe bij, de uitdagingen gerelateerd aan onzekerheid te overwinnen en helpt bedrijven te overleven.

Dit boek verbindt de theoretische concepten met de bedrijfsvoering. Het volgt het strategie proces van bedrijfsanalyses, gericht op specifieke problemen, en uiteindelijk, strategisch advies. Het basisontwerp is geïntegreerd in het proces daar waar het de verwezenlijking benadrukt of middelen verstrekt om specifieke problemen te overwinnen. Ten slotte zal deze benadering bijdragen tot de toepassing en integratie van de huidige theoretische wetenschap, hetgeen een voordeel is voor zowel het leiderschap als de raadgevende uitvoering.

Onderstaand diagram toont de interactie tussen het strategisch proces, de industriële trends en het basisontwerp.

Figure: Integration of theoretical concepts into the strategy process



De analyse van de industrie laat zien dat de toekomstige telecom arena een onderdeel zal zijn van de opkomende multimedia-industrie. Tegelijkertijd houdt de argumentatie rekening met het huidige leidinggevende perspektief van een telecom-bedrijf, en wordt ondersteund door dagelijkse voorbeelden, gebaseerd op de eigen ervaring in de internationale telecommunicatie markt.

Teneinde de problemen in het strategisch proces te overwinnen, worden analytische modellen geselecteerd en toegepast om een actief kader te scheppen als onderdeel van de industriële analyses. De twee belangrijkste hoofdonderwerpen bestaan uit:

1. Globalisatie in de multimedia-industrie. Het actief kader wordt toegepast om het wereldwijde potentieel van de verschillende activiteiten te onderscheiden.
2. Onzekerheid in de industriële organisatie. Deze onzekerheid in de opkomende multimedia-industrie wordt geleid door de de ontwikkeling van drie draaiboeken van toekomstige scenario's.

De onderdelen van de analyse van de industrie en het multimedia-industriele kader zijn nauw met elkaar verbonden, teneinde de interactiviteit van deze onderdelen in het bedrijfs-strategisch proces aan te tonen. De gevolgen van de analyses van het wereldwijde potentieel en de industriële draaiboeken worden besproken ten behoeve van verschillende typen van multimedia deelnemers.

Ten slotte toont het boek hoe het kader kan worden ontwikkeld en gebruikt kan worden voor toepassing in andere „netwerk based industries" zoals b.v. de electriciteitsindustrie.

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